Medicare Hospital

INFORMATION

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MEDICARE HOSPITAL INFORMATION

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Volume 9

DELAWARE

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STATES BY VOLUME

VOL	STATE	VOL	STATE
1	ALABAMA	28	MONTANA
2	ALASKA	29	NEBRASKA
3	ARIZONA	30	NEVADA
4	ARKANSAS	31	NEW HAMPSHIRE
5	CALIFORNIA (Part 1)	32	NEW JERSEY
6	CALIFORNIA (Part 2)	33	NEW MEXICO
7	COLORADO	34	NEW Y0RK
8	CONNECTICUT	35	NORTH CAROLINA
9	DELAWARE	36	NORTH DAKOTA
10	DISTRICT OF COLUMBIA	37	OHIO
11	FLORIDA	38	OKLAHOMA
12	GEORGIA	39	OREGON
13	HAWAII,	40	PENNSYLVANIA
	AMERICAN SAMOA	41	PUERTO RICO
	GUAM		VIRGIN ISLANDS
14	IDAHO	42	RHODE ISLAND
15	ILLINOIS	43	SOUTH CAROLINA
16	INDIANA	44	SOUTH DAKOTA
17	IOWA	45	TENNESSEE
18	KANSAS	46	TEXAS (Part 1)
19	KENTUCKY	47	TEXAS (Part 2)
20	LOUISIANA	48	UTAH
21	MAINE	49	VERMONT
22	MARYLAND	50	VIRGINIA
23	MASSACHUSETTS	51	WASHINGTON
24	MICHIGAN	52	WEST VIRGINIA
25	MINNESOTA	53	WISCONSIN
26	MISSISSIPPI	54	WYOMING
27	MISSOURI	55	TECHNICAL SUPPLEMENT

FOREWORD

The mission of the Health Care Financing Administration (HCFA) is to promote the timely delivery of appropriate, quality health care to the nation's aged, disabled, and poor. The agency must also ensure that beneficiaries are aware of the services for which they are eligible, that those services are accessible, and that agency policies and actions promote efficiency and quality within the total health care delivery system.

To that end, the annual release of the Medicare Hospital Information report is a key element in our continuing efforts to improve the effectiveness of medical practice and the quality of care provided to Medicare beneficiaries. It is also an important step in helping beneficiaries make more informed health care decisions.

The information in this release is not intended as a direct measure of quality of care. It is best used as a "screening tool"—that is, to identify potential problems for further review and, in consultation with medical staff, to evaluate a hospital's strengths and weaknesses. Thus, we believe that consumers can use this information to ask questions of their physicians, rather than reach judgments about the quality of care in a particular hospital. We also expect this information to be used by hospital administrators, physicians, peer review organizations, State survey and certification agencies, and researchers.

This publication presents information to answer the question "What is the actual mortality rate within a certain period of time for each hospital compared to the rate that would have been predicted, given what we know about the characteristics of the patients admitted?" Our basic approach to analyzing hospital mortality information has remained unchanged for the past five years; however, since the last publication of mortality information in May 1991, we have made some significant changes both in our methodology and in the way we display the results of our analysis. The four principal changes in the 1992 report are:

- A graphic presentation of the predicted and observed mortality rates for most hospitals for "All Causes" for Federal fiscal years 1988-1990 at 30, 90, and 180 days;

- The addition of information on certain variables that we use in computing the predicted mortality rates for each hospital;

- The addition of information on the geographic origin of each hospital's patients; and

- A comparison of the average length of stay in each hospital with the average for the State and Nation.

These refinements should make this information an even more valuable educational tool to help improve the quality of care in hospitals. The changes were reviewed by a panel of outside experts. The methodology used to calculate the observed mortality rate, the predicted mortality rate, and the standard deviation are briefly described in the Technical Information section of the Introduction to this volume and in more detail in the Technical Supplement (Volume 55).

We acknowledge the assistance we have received from the American Hospital Association—not only for providing the information detailing selected hospital characteristics, but also for alerting its members to the importance of this information. We are also grateful to the personnel in each hospital who took the time to review the data thoroughly and to provide us with comments and suggestions. As before, we have published individual hospitals' comments in their respective State volumes. Over the years, these communications have helped to improve and refine the information included in this publication.

HCFA is committed to improving the Medicare Hospital Information report. To that end, we are continuing to work with representatives of hospital, consumer, employer and other organizations to make this annual report as useful as possible for all consumers.

TABLE OF CONTENTS

Introduction vii

BEEBE MEDICAL CENTER 2
KENT GENERAL HOSPITAL INC 4
MEDICAL CENTER OF DELAWARE 6
MILFORD MEMORIAL HOSPITAL INC 8
NANTICOKE MEMORIAL HOSPITAL INC 10
RIVERSIDE HOSPITAL 12
ST FRANCIS HOSPITAL INC 14

State and National Hospital Information 16

Hospital Comments

INTRODUCTION

The Medicare Hospital Information report contains information on acute care hospitals that treated Medicare patients discharged in Federal fiscal year (FY) 1990 (October 1, 1989—September 30, 1990).

This year's publication set consists of 54 State volumes and a Technical Supplement (Volume 55). There is one volume per State, except that California and Texas have two volumes each, Hawaii is combined with American Samoa and Guam, and Puerto Rico and the Virgin Islands are combined together in one volume.

Each hospital's two summary data pages are arranged alphabetically by hospital name in each State volume. These data pages consist of:

- The hospital's FY 1990 Medicare hospital mortality rates;
- A graphic presentation of the predicted and observed mortality rates for **most** hospitals for "All Causes" for FYs 1988—1990 at 30, 90, and 180 days;
- The FY 1990 values for selected explanatory factors used to predict the mortality rates;
- Origins and lengths of stays of Medicare admissions; and
- Hospital characteristics, such as the number of beds and other characteristics, which we obtained from data contained in the American Hospital Association's (AHA) 1990 Annual Survey of Hospitals files or, when such information was not available from the AHA file, the Health Care Financing Administration's (HCFA) Online Survey, Certification and Reporting System (OSCAR) file.

Please note that the information regarding origins and lengths of stays and hospital characteristics are presented strictly for information purposes only. They were not used to calculate the hospital's predicted mortality rates.

Toward the end of each volume, we include both State and national mortality rates developed by our analysis, as well as the comments we received from individual hospitals.

DESCRIPTION OF MORTALITY INFORMATION

The mortality rates at a given hospital may reflect, among other factors, the age, sex, diagnoses, and severity of illness of patients admitted to that hospital, as well as the quality of care they received. Factors affecting health and the probability of death vary among the patient populations served by individual hospitals. Consequently, the mortality rates in different patient populations vary considerably.

These latest analyses of the mortality rates associated with Medicare hospitalizations are similar to those carried out in the four prior years. Only one hospitalization for every patient was used. As in last year's analysis, when a patient had multiple hospitalizations during the fiscal year, one stay was selected at random to be analyzed. We believe that the use of the randomly selected admission provides a better representation of a typical hospital admission and permits us to calculate mortality rates more nearly like those the hospital itself would calculate for its patients.

Although we publish data only on deaths which occur within 180 days of admission to the hospital, for purposes of analysis our methodology actually considers deaths which occur any time within 365 days of admission (with the exception that no date of death later than April 1, 1991 is used). This is part of the formula which assesses the long-term risk of mortality. With this approach, information about the early and later results of the hospitalization is provided. This is important because diseases evolve with different time courses, and treatments may have different short- and long-term effects. The choice of at least 180 days allows substantial followup consistent with timely reporting of HCFA data.

We again analyzed the data on a fiscal year, rather than on a calendar year, basis because it allows us to report on recent hospitalizations. Also, new Medicare rules are often instituted on a fiscal year basis.

For each hospital, mortality rates are presented for overall Medicare patient mortality and for eight medical conditions and nine procedures. The information consists of the number of Medicare patients; the observed or actual mortality rate (OBS); the predicted mortality rate (PRED), given the mix of patients; and a standard deviation (SD), a measure of the uncertainty of the predicted rate.

The following information will be helpful when reviewing specific information for any given hospital.

Number Of Cases

This is the number of individual Medicare beneficiaries whose discharge in a fiscal year from the short-term, acute care hospital listed was selected for analysis. The total number of cases randomly selected for each hospital is presented under the category "All Causes." The eight medical condition and nine surgical procedure categories are subgroupings drawn from the "All Causes" selection. Although a particular patient may appear in only one of the eight medical condition categories, that same patient may also appear in one or more of the nine surgical procedure categories. Similarly, a patient may appear in one or more of the nine surgical procedure categories, even though he or she was not included in any of the eight medical condition categories.

The categories chosen for display represent HCFA's interpretation of the categories judged to be important by various outside advisors including the Institute of Medicine. The listed condition and procedure categories do not cover the reason for admission of all the hospitalized Medicare patients in this study. (The ICD-9-CM codes included in each condition and procedure category appear in Table 1 following this Introduction section.)

These conditions and procedures represent the causes for the hospital admission and/or surgical episodes during that stay; they do not necessarily represent the cause of death. HCFA does not have access to cause of death information.

Observed Mortality Rate (OBS)

The observed mortality rate for each category is the percentage of each acute care hospital's selected Medicare patients who died within 30, 90, or 180 days of the selected admission. This rate does **not** represent the percentage whose death was caused by a particular condition or procedure.

The percentage is rounded to the nearest one-tenth of one percent. Both inhospital deaths and deaths occurring after discharge but within 30, 90, or 180 days of admission are included. For example, if a hospital had 1,000 patients included in the "All Causes" category and 124 of these patients died within 30 days of the selected admission, the 30-day observed mortality rate would be 12.4 percent; if an additional 17 patients died more than 30 but less than 91 days after admission, the 90-day observed mortality rate would be 14.1 percent; and if an additional 13 patients died more than 90 but less than 181 days after admission, the 180-day observed mortality rate would be 15.4 percent.

It is important to note that the observed mortality rate is cumulative; e.g., the 90-day observed mortality rate includes all deaths which occur within 30 days of admission, as well as those occurring more than 30 and less than 91 days after admission.

Predicted Mortality Rate (PRED)

The predicted mortality rate for each hospital's patients is derived in part by determining, based on national experience, the contribution to the probability of dying associated with various patient characteristics such as:

- Principal diagnosis (grouped into 23 analytical risk categories),
- Age,
- Sex,
- Previous hospital admissions within the prior six months,
- Admission source (e.g., physician reference, skilled nursing facility reference),
- Admission type (e.g., elective or emergency), and
- The presence of up to seven comorbid conditions—cancer, chronic cardiovascular disease, chronic renal disease, chronic liver disease, chronic pulmonary disease, cerebrovascular degeneration, and chronic diabetes. A list of the ICD-9-CM codes defining the comorbid conditions is in Table 2 following this Introduction section.

Standard Deviation (SD)

The standard deviation is a tool to gauge the extent to which the difference between the observed and predicted mortality rate is meaningful. In general, the greater the difference between the two rates, the greater the probability that the difference represents an actual variation from what would be expected in view of the national experience. The less chance that the difference between the PRED and the OBS can be attributed to statistical variability, the more grounds for possible concern about the institution's performance.

Information on how to use the SD to construct prediction intervals for use in assessing the real difference between the OBS and the PRED is included in the Technical Information section of this Introduction. The precision and interpretability of the estimates are weaker when there are no deaths or 50 or fewer cases in a particular category being analyzed. Thus, for these instances, dashes ("---") are placed in the SD column.

Observed Mortality Rate And Predicted Range For Medicare Patient Admissions For All Causes

Also in this year's report, we have presented graphs that display the information for most hospitals described above for FYs 1988 and 1989, as well as FY 1990. (In particular, these graphs could not be computed for hospitals that had 50 or fewer cases or no deaths in FYs 1988, 1989, or 1990). In constructing the graphs, we used 2 times the standard deviation to approximate a 95 percent prediction interval. The observed mortality is shown as a dot (•). The predicted mortality is shown at the middle of a range of mortality rates. The bottom of the range is the predicted mortality minus twice the standard deviation, and the top of the range represents the predicted mortality plus twice the standard deviation. The graphs for FY 1988 and FY 1989 are based on new random samples and new computations for this year's report. Thus, the calculations for some hospitals for FY 1988 and FY 1989 may be different from previous releases, because we are including more current data in this year's report.

FY 1990 Values For Selected Explanatory Factors Used To Predict Mortality Rates

This year's report includes the FY 1990 average at each hospital of many of the explanatory factors used to predict that hospital's mortality rates. This information provides a profile of the patients used in the analysis and should help to identify possible systematic coding errors in the claims data used to calculate the mortality rates. These percentages are derived from the patients included in the sample and should be applied to the total number of cases listed in "All Causes." It is important to note that neither the admission sources/types nor the comorbidities categories are mutually exclusive. For example, a patient could be both "referred by his personal physician" and "admitted for elective procedure." Similarly, a patient could have secondary diagnoses of both cancer and diabetes.

Information Sources And Notes

We believe that when the mortality rate information is properly understood and applied, it can be very useful; it can also be misleading if it is interpreted incorrectly. The information simply describes one of several possible outcomes at a hospital—postadmission mortality for Medicare beneficiaries.

Mortality information is not necessarily representative of a hospital's total performance in all aspects of patient care. Individual hospitals may have very good reasons for their rates being higher than the rates predicted by the HCFA model. For example, one hospital might have different death rates than another because its patient mix is not fully accounted for by the model.

Accordingly, we offered each hospital the opportunity to review their specific information and to provide comments to HCFA and the public, and we included those comments that were received timely at the end of this volume. Users should read the discussions about the uses and limitations of the mortality information found on page xiii, as well as any comments a hospital may have provided.

Hospitals In The Analysis

The hospitals included in this analysis are participating in Medicare as short-term, acute care facilities—all have a zero in the third position of their Medicare provider number. All other hospitals—those with something other than a zero in the third position of their provider number, such as rehabilitation facilities or psychiatric institutions—were excluded. This year, as in the past two years, we have also excluded hospices.

In some cases, we have included data for hospitals that closed, changed ownership, or changed management either during or subsequent to FY 1990. Our data included for those institutions reflects the situation as it existed at the time the hospitalizations analyzed occurred.

Data Sources

This report is based primarily on Medicare hospital billing information for Federal fiscal years 1988, 1989, and 1990. While the principal source of the data for the analysis was the HCFA-maintained Medicare Provider Analysis and Review (MEDPAR) file, which contains information about each Medicare hospitalization, some of the information about beneficiaries, such as date of death, was obtained from the Social Security Administration. Hospitals submit bills to HCFA's fiscal intermediaries (which handle claims for the inpatient care provided to Medicare beneficiaries) which, in turn, submit this information to HCFA. The file is updated on a quarterly basis. Our analysis was based on information available following the June 1991 update of the MEDPAR file. It is estimated that by that time (nine months after the close of the fiscal year), 98 percent of all Medicare discharges in FY 1990 are included in the file.

Possible Limitations Of The Data

In any large-scale data base, such as the one dealing with Medicare hospitalizations, there will be gaps or inaccuracies. For example, last year some hospitals had not accurately reported the source or type of admission, and thus erroneous information was included in the analysis for those hospitals. However, the fact that the files contain information on about 10 million hospital admissions to nearly 6,000 hospitals for each year provides some assurance that, for purposes of the statistical analysis conducted here, the information that might be

missing or inaccurate is such a small portion of the total that it would have little effect on the results for national estimates. Nevertheless, it may substantially affect an individual hospital if it were the source of the inaccurate information.

While we feel that the information used in this analysis is thorough and complete, there are a few points to keep in mind as you review the mortality information.

The information used is billing data; it is only as good as the information submitted by hospitals as part of the payment process. Although there is always a possibility that coding errors are included, we assume that, given the link to payment, hospitals have an incentive to submit bills accurately and promptly. We do know, however, that some hospitals submitted incomplete or erroneous data.

For example, following last year's public release of the hospital mortality data, several hospitals wrote to HCFA indicating that they had submitted incorrect data. Furthermore, they stated that if they had given us the correct information, their predicted mortality rates would have been higher than those presented in HCFA's report. Therefore, in this year's report we have annotated those hospitals' data pages with a footnote stating: "This hospital says that it submitted inaccurate data to Medicare and claims that its predicted mortality rate should be higher than that presented above." At this point, however, HCFA cannot confirm the validity of those hospitals' claims. The analysis results might very well be different if the data on which they were based were submitted accurately by those hospitals.

In our previous analysis of mortality data, we discovered that some States had zero admissions from a skilled nursing facility. While some of these problems were corrected on the MEDPAR files used for this analysis, at the time this study was initiated we found empirical evidence that some of the files still contained suspect information. The suspect data were identified by noting those months (date of discharge) and fiscal intermediaries for which the type and source of admission fields appeared to be interchanged. Based on our findings, we reversed these fields to at least partially correct the remaining discrepancies. The following list shows the specific instances for which the fields were reversed for this analysis.

TYPE AND SOURCE OF ADMISSION FLIPPED

FI No.	FI Name	Dates
00030	Arizona Blue Cross	10/01/86 — 12/31/88
00080	Maryland Blue Cross/DC	06/01/87 — 09/30/87
00190	Maryland Blue Cross	06/22/87 — 12/31/88
00400	Texas Blue Cross	12/07/87 — 12/31/88

How To Use This Information

There are several key points to remember about the use of this information. **First, it is important to understand that the difference between the hospitals' mortality rates and the predicted rates in the tables in this report may not be a direct measure of the quality of care rendered in the hospitals.**

Second, the usefulness of this information depends upon the accuracy with which mortality rates can be predicted. We do not currently have any direct measurement tool with which we can fully adjust for severity of patient illness differences among hospitals. For instance, two hospitals may have very different death rates for patients admitted for stroke, even after we have adjusted for age, sex, and several other factors. This might happen because one hospital's stroke patients may consist of a significant number who are admitted in a coma (and are thus more likely to die), whereas another hospital's patient population may represent a broader spectrum of patients with cerebrovascular problems, or because these two hospitals, in fact, do provide different levels of quality of care. In addition, other factors affecting the probability of death in a particular case (e.g., family status/support, overall health status of the patient, etc.) are not included in the predictive model because information on them is not readily available.

Nevertheless, we believe that the information presented in this publication is an important contribution to the health care community and should be helpful to a wide range of individuals and organizations including consumers, hospital administrators, physicians, PROs, and researchers.

Use By Consumers — Some Key Questions

Consumers should read carefully the explanations of the uses and limitations of the information. Listed below are some questions that we recommend a consumer think about before choosing a hospital. Please keep in mind that this is not a comprehensive list, but it should serve to illustrate the types of questions that are important to consider.

- Why are the hospital's observed mortality rates for "All Causes" consistently and significantly above the predicted rates for FY 1990?

- Why are the hospital's observed mortality rates for the condition for which I need treatment or the procedure I will undergo consistently and significantly above the predicted rates for FY 1990?

- How does this hospital's pattern of mortality compare with that of other hospitals in the State and Nation?

- Is the number of cases too small to present a satisfactory picture of the hospital?

- Does the hospital treat a large number of cases in the category for which I need treatment?

- Does the hospital treat a large number of patients who have several co-existing illnesses or who otherwise are likely to be "sicker" than average?

Other Users Of This Publication

Among other users of this publication, we expect that the hospital administrator (in consultation with medical staff) will find the information most useful as a screening tool to evaluate a hospital's strengths and weaknesses. We know that some hospitals and their medical staffs, using established and newly emerging quality assessment techniques, are seeking information that will result in improved health care delivery.

Outside Assistance In Developing This Publication

The development and presentation of the Medicare Hospital Information report continues to be an important part of HCFA's responsibilities in the health care community. To make the information as accurate and useful as possible, over the past several years we have discussed the theoretical framework and statistical approach with a number of nationally recognized technical experts in appropriate fields. Based on their recommendations, we believe that the models used in these analyses continue to be reasonable and appropriate.

In the past, we have conducted validation studies of our methodology. In general, these studies have found correlation between poor quality care and hospitals whose observed mortality rates significantly exceed the rates that would have been predicted. However, we have also found that detailed clinical data which more thoroughly characterize the severity of patient's illness, while they do not materially affect results describing the general pattern of mortality, do, in specific instances, alter our assessment of the comparison of the observed to the predicted mortality rates.

The format for presentation, the process for sharing the information with individual hospitals, and the statistical methodology have been discussed at various meetings with leaders of organizations representing Medicare beneficiaries, physicians, and hospitals. Also, we have spent many months reviewing the comments received from the hospitals regarding their patient-specific data for earlier years and our previous mortality information reports. Many suggestions from these sources have been incorporated into this report.

We have carefully investigated comments from individual hospitals on apparent discrepancies or errors generated in previous years. These discrepancies rarely had an effect on a hospital's overall mortality rate. Most of these instances fell into the following two broad categories.

- **Inaccurate Date of Death** — We found that inpatient billing coding errors (e.g., a hospital bill indicating that the patient's status at time of discharge was "expired" when the patient had, in fact, left the hospital alive) created many of these errors. We now have mechanisms in place that allow a continuous update of HCFA's master file, thereby enabling us to make corrections.

- **Discrepant Case Counts** — Our analysis counts only one acute care discharge in a fiscal year; normally, hospitals count each discharge. Thus, a patient admitted three times in a year would count three times for the hospital, but only once for the purpose of analyzing Medicare hospital mortality data presented in this report.

We believe it is important for consumers of health care to have access to as much information about hospitals as possible when making health care choices. Along with hospital characteristics information, we have added this year information about the origin and length of stay of Medicare admissions. This information is presented for comparative purposes only and was not used in calculating a hospital's predicted mortality rates. These data were not part of the analyses, and any errors or discrepancies in them do not affect the predicted mortality rates.

ORIGIN OF MEDICARE ADMISSIONS

Data on the geographic origin of each hospital's patients are presented in this year's report. We obtained from the Health Insurance Master file the State and county of residence for each Medicare beneficiary discharged from a Medicare-certified, acute care hospital during FY 1990. We then compared that information with the location of the hospital to determine the percentage of all discharges where the patient lived within the same city/county as the hospital location, within the State where the hospital is located, or outside the State. The percentages are derived by dividing the number of discharges of beneficiaries in a geographic category by the total number of Medicare discharges from the hospital. Please note that these are percentages of total Medicare discharges, not of the mortality sample alone.

MEDICARE AVERAGE LENGTH OF STAY

We obtained from the MEDPAR file the total days of care—both Medicare covered and noncovered—and divided that total by the number of discharges from each hospital. Total, rather than covered, days were used because, under the Prospective Payment System (PPS), if a Medicare patient has at least one day of hospital coverage available to him in the current spell of illness, the hospital will be paid the full diagnosis related group (DRG) amount plus any approved outlier amount, regardless of the number of days actually used.

Example: Hospital A had 2,513 Medicare discharges with a total of 24,379 days.

Calculation: $\frac{24{,}379}{2{,}513} = 9.7$ days

The Medicare average length of stay is 9.7 days.

HOSPITAL CHARACTERISTICS

As noted previously, we have again included information on selected hospital characteristics such as the number of beds, occupancy rate, ownership, staffing, and specialty services. This information was obtained from the American Hospital Association's (AHA) 1990 Annual Survey of Hospitals, with the exception of the case mix index (CMI), which was derived from HCFA billing data. This file consists of information voluntarily reported by hospitals to the AHA. In instances where AHA data were unavailable, for example for hospitals that did not respond to the AHA survey, we derived the information from HCFA's Online Survey, Certification and Reporting system (OSCAR). The hospital characteristics and the specific special services listed were selected with the concurrence of the AHA as being those most meaningful to the Medicare population. Information on these specific data elements follows.

AHA Definitions (except for CMI)

Survey and Year — AHA 1990. Source is the American Hospital Association's 1990 Annual Survey of Hospital files.

Profile

Total beds (#) — Number of beds (including subacute beds), cribs, and pediatric and neonatal bassinets regularly maintained (set up, staffed, and ready for use) for inpatients as of the close of the reporting period; does not include bassinets for normal newborn infants.

Occupancy rate (percent) — Ratio of average daily census to the average number of beds (statistical beds) maintained during the 12-month reporting period. (NOTE: The number of these "statistical beds" may differ from the bed count at the close of the reporting period.)

Ownership/control — State government, local government, district/authority, church, private nonprofit, private for profit, or Federal Government.

Medicare discharges — The total number of inpatient discharges for Medicare patients for those hospitals selected for the mortality calculations, including all discharges for persons with more than one hospitalization during the year. (The mortality data include only one randomly selected discharge for each hospitalized enrollee. Therefore, this figure may reflect more discharges than the actual number of cases randomly selected for the mortality study.)

Case mix index (CMI) — A measure of the overall complexity of the Medicare cases treated by a given hospital compared to the complexity of the national average case mix. The CMI represents the relative costliness of each hospital's mix of cases compared to the national average mix of cases. A CMI of greater than one means that a hospital treats more complex cases than average. A CMI of less than one means that a hospital treats less complex cases than average. The CMI for each hospital is calculated on an annual basis. In this report, the CMI presented for each hospital is calculated based on its discharges in FY 1990.

A hospital's CMI is calculated by multiplying the number of cases in each DRG by the relative weight of that DRG, summing the products, and dividing the sum by the total number of cases for the year. For calculating the FY 1990 CMI, use the DRG relative weights published in the *Federal Register*, Volume 54, Number 169, pages 36468 ff., dated September 1, 1989.

Staffing (all AHA counts are as of 9/30/90)

Total number of physicians — Total active and associate medical staff.

Percent of physicians who are board-certified specialists — Physicians who have passed an examination given by a medical specialty board and have been certified by that board as a specialist.

Medical residents/interns — Full-time equivalent (FTE) medical residents or interns.

Registered nurses — Full-time equivalent (FTE) registered nurses.

Licensed practical nurses — Full-time equivalent (FTE) licensed practical nurses.

Specialty Services

Burn Unit — Provides more intensive care to severely burned patients than the usual acute nursing care provided in medical and surgical units. Beds must be set up and staffed in a unit specifically designated for this service.

Cardiac Intensive Care — Provides patient care of a more specialized nature than the usual medical and surgical care, on the basis of physicians' orders and approved nursing care plans. The unit is staffed with specially trained nursing personnel, and contains monitoring and specialized support or treatment equipment for patients who, because of heart seizure,

open-heart surgery, or other life-threatening conditions, require intensified, comprehensive observation and care. May include myocardial infarction, pulmonary care, and heart transplant units. Beds must be set up and staffed in a unit(s) specifically designated for this service.

Comprehensive Geriatric — Provides diagnostic and evaluation services that determine elderly patients' long-term care needs. It includes the assessment of medical conditions, functional activities, and mental and emotional conditions, and incorporates these into a treatment plan which includes family and financial concerns as well as medical needs.

Hospice Care — A program providing primarily medical relief of pain and support services to terminally ill patients and assistance to their families in adjusting to the patients' illness and death.

Medical/Surgical Intensive Care — Provides nursing care to adult and/or pediatric patients of a more intensive nature than the usual medical, surgical, pediatric, and/or psychiatric care on the basis of physicians' orders and approved nursing care plans. Included are medical-surgical, pediatric, and psychiatric (isolation) units. These units are staffed with specially trained nursing personnel, and contain monitoring and specialized support equipment for patients who, because of shock, trauma, or life-threatening conditions, require intensified, comprehensive observation and care. These units may also include cardiac care when such services are not approved in a distinct cardiac care unit. This category is called "intensive care unit" in OSCAR.

Organ/Tissue Transplant — The hospital has the necessary staff and equipment to perform the surgical removal of a viable human organ or tissue from a donor, either living or deceased, and the surgical grafting of the organ/tissue to a suitably evaluated and prepared patient.

Other Intensive Care — Provides nursing care to adult and/or pediatric patients with a specialized disease or condition of a more intensive nature than the usual medical, surgical, pediatric, and/or psychiatric care on the basis of physicians' orders and approved nursing care plans. Examples reported include oncology or spinal cord injuries. These units are staffed with specially trained nursing personnel and contain monitoring and specialized support equipment appropriate for the patients' specialized conditions.

Trauma Center — Provides emergency and specialized intensive care to critically injured patients.

Other Specialty/Hospital-Based Services

Alcohol/Drug — Hospital services for the medical care and/or rehabilitative treatment of outpatients whose primary diagnosis is alcoholism or other chemical dependency.

Rehabilitation — A unit having designated beds and providing a comprehensive array of multidisciplinary medical rehabilitation services.

Psychiatric — Care provided to emotionally disturbed, chronically mentally ill, mentally disordered, or other mentally incompetent patients on the basis of physicians' orders and approved nursing care plans. Beds must be set up and staffed in units specifically designated for this service.

Medicare Swing Beds — The hospital is certified by Medicare to provide "swing bed" services; that is, some acute care beds can be used for skilled nursing facility type care in the hospital for Medicare purposes.

OSCAR Definitions (except for CMI)

Survey and Year — HCFA, most recent year. Data were derived from the Online Survey, Certification and Reporting System (OSCAR).

Profile

Total beds (#) — Total number of operational beds eligible for Medicare payment.

Ownership/control — Church; private, nonprofit; other nonprofit; proprietary; Federal Government; State government; local government; and hospital district or authority.

Case mix index (CMI) — See definition shown in AHA "Profile" section.

Staffing

Medical residents/interns — Full-time equivalent (FTE) medical residents or interns.

Registered nurses — Full-time equivalent (FTE) registered nurses.

Licensed practical nurses — Full-time equivalent (FTE) licensed practical nurses.

Specialty Services

NOTE: There are no specific definitions of specialty services in OSCAR. Characteristics are self-reported by each hospital at initial Medicare certification and recertification, and are generally understood to parallel the explicit AHA definitions (above). The AHA categories "comprehensive geriatric" and "other intensive care" are not available in OSCAR. However, they may be included in the OSCAR category of other specialty services (not shown in table).

Coronary Care — See definition shown in AHA "Specialty Services" section.

Intensive Care Unit — See definition shown in AHA "Specialty Services" section. These units may also include other intensive care units in OSCAR reporting.

Organ Transplant — See definition shown in AHA "Organ/Tissue Transplant" section. May include tissue transplants because there is not a separate field in OSCAR for these services.

TECHNICAL INFORMATION

DATA SOURCES

The data analyzed in this report are obtained from the Medicare Provider Analysis and Review (MEDPAR) file for the fiscal years 1987-1990, which contains information on the hospital stays of Medicare beneficiaries. The principal sources of data for this file are the bills (known as HCFA-1450 or UB-82) submitted by the hospitals to HCFA through fiscal intermediaries. The MEDPAR file also contains data about the beneficiaries, such as age, sex, and date of death, which are obtained from the Social Security Administration, the Railroad Retirement Board, or the Office of Personnel Management.

Hospital stays with discharges in fiscal years 1988, 1989, and 1990 were used in these analyses. Hospital stays in 1987 were used only to characterize the prior admissions of the patients in the 1987 cohort. Only acute care hospital stays in short-term (general and specialty) hospitals were selected. These hospitals have a "0" in the third position of their Medicare provider number. Hospital stays in institutions (designated by a "9" in the fourth position of the provider number) and hospital stays in psychiatric units, rehabilitation units, swing-beds and alcohol/drug units (with "special unit codes" of S, T, U and V, respectively, in the third position) were excluded.

THE MORTALITY MODEL

For each beneficiary in each year one hospitalization was selected at random. Choosing a specific hospitalization is necessary to avoid multiple counting of the same death for that year. Selecting a random hospitalization instead of the first or last in the year produces mortality rates that are more representative of the rates that a hospital might calculate for its patients. Also, the mortality rates based on this random selection process reflect an intermediate position between the rates produced by the alternatives.

The selected hospital stays were analyzed separately by analytical category. The analytical categories were created by grouping ICD-9-CM diagnosis codes that had similar mortality patterns. The procedures for creating the analytical categories and the groups of ICD-9-CM diagnosis codes that defined them are detailed in the Technical Supplement.

The mortality experience of the patients was evaluated as a function of time within 365 days of the admission. The factors included in the mortality model used to evaluate each patient's probabilities of death are given in Table 3. They consist of demographic characteristics (age and sex), major comorbidities (chronic diseases likely to have been present at admission and believed to

complicate management and increase the likelihood of an adverse outcome), prior admissions (grouped into five risk or severity levels) within the 6 months preceding the admission evaluated, admission type (emergent, elective, etc.), and admission source (referral from the physician's office, the nursing facility, etc.). The specific reason for the admission (the principal diagnosis) and the performance of selected surgical procedures were additional factors used in the estimation of the predicted probability of death (see below).

The observed mortality rate for a hospital was calculated by means of the lifetable method ("The LIFETEST Procedure," Chapter 22, SAS User's Guide: Statistics, Version 5 Edition, pages 529-557).

ANALYTIC TECHNIQUES

A time-to-event or survival model with explanatory or concomitant variables was used to ascertain the influence of the patient characteristics listed above on the probability of death. A feature of such a model is allowance for "right censored" observations. Generally, these are events or outcomes which would have occurred but for some interference that prevents further observation. In the present analysis, "right censoring" occurs when a patient is withdrawn alive from the study April 1, 1991 or at the end of the followup period of 365 days.

The survival function, S(t), is one of several equivalent ways of expressing the model. Another form uses the cumulative distribution function or the mortality function

$$F(t) = 1 - S(t).$$

Another useful formulation of these models is the hazard function, h(t), also known as the force of mortality or risk function. The hazard is the rate of decrease in the number of survivors relative to the number of survivors at a specific time. Mathematically, the hazard function is

$$h(t) = -\frac{1}{S(t)}\frac{dS(t)}{dt} = -\frac{d\ln(S(t))}{dt}.$$

The probability density function, f(t), commonly used in statistical texts can be expressed as follows:

$$f(t) = \frac{dF(t)}{dt} = h(t)S(t).$$

The area under the survival curve is the expected value for t. In some cases, the area under the survival curve is restricted to an interval $0\text{-}t_1$ where t_1 might be one year, for example.

The specific time-to-event or survival model used in the present analysis is Bailey's modification of the Makeham model. The survival function for the Bailey-Makeham model is

$$S(t) = \exp\left\{-\delta t - \left(\frac{\alpha}{\gamma}\right)(1 - \exp(-\gamma t))\right\}$$

where

$$\alpha = \exp(\alpha_0+\alpha_1 x_1+\ldots+\alpha_i x_i+\ldots+\alpha_k x_k)$$
$$\gamma = \exp(\gamma_0+\gamma_1 x_1+\ldots+\gamma_i x_i+\ldots+\gamma_k x_k)$$
$$\delta = \exp(\delta_0+\delta_1 x_1+\ldots+\delta_i x_i+\ldots+\delta_k x_k)$$

are the expressions for each of the structural parameters α, γ, and δ in terms of the k concomitant variables x_i and their associated component parameters α_i, γ_i, and δ_i for i=1, 2,..., k and three intercepts or component parameters α_0, γ_0, and δ_0. The structural parameter δ is the long-term risk which is approached as $t \rightarrow \infty$. The structural parameter α is the initial excess risk which decays with rate constant γ.

For the survival function given above, the risk or hazard function has an especially tractable form of an exponential decay which approaches a long-term risk, δ. The hazard function corresponding to the survival function above is

$$h(t) = \alpha\exp(-\gamma t) + \delta \ .$$

The estimation of the component parameters was carried out in a series of steps in which those covariates which had estimable and statistically significant ($p<0.05$) influences of the probability of death were identified for inclusion in the model. As the model for each of the 23 risk categories was estimated separately, different lists of covariates were used for the final core models.

This first step was followed by the estimation of the additional contribution of specific principal diagnoses in each risk category. In these analyses, the effects of the patient characteristics included in the core models were corrected for. Only those principal diagnoses were retained which were estimable and had more than 900 cases (more than 300 for codes identified by year). Similarly, after adjustment for the effects of both the variables in the core model and the principal diagnoses, correction terms were calculated to estimate the additional information about the probability of death associated with the categorization of the patients into the clinical groups used for the presentation of the data in the mortality tables (see below). These correction terms were negligible for the medical categories but substantial for the surgical categories.

Once the component parameters or regression coefficients α_i, γ_i, and δ_i have been estimated, the predicted probability of patient death at any specified time after admission, 1-S(t), may be calculated for all individuals. To obtain the predicted mortality rate up to a given time for a hospital, it is then only necessary to average over the predicted probabilities of death of its patients to that time.

The analytical categories are useful for grouping the patients into relatively risk-homogeneous strata for the regressions. However, to gain insights into patterns of practice at hospitals, the data are presented for patients grouped into clinically meaningful medical and surgical categories. The 17 clinical categories used in the mortality tables and defined in Table 1 were identified by the Institute of Medicine as being of particular medical and epidemiologic interest.

ESTIMATION OF THE STANDARD DEVIATION FOR PREDICTED MORTALITY

The standard deviation of the predicted mortality rate is used to assess how statistically different the observed mortality rate is from the rate predicted by the national experience with like patients. The standard deviation depends, in fact, on the variance of the residual or the difference between the observed, P, and predicted, $\hat{\Theta}$, mortality rates.

The residual has four components V_1, V_2, V_3, and V_4 where V_1 is the variance of the estimate of the predicted probability of death. This computationally intensive term was negligible for nearly all cases, compared to other components of variance. Consequently, this term was not included in the present analysis.

V_2 is the binomial variance for n patients

$$V_2 = \frac{\hat{\Theta}\left(1 - \hat{\Theta}\right)}{n}.$$

V_3 is the variation among hospitals not explained by the mortality regression models containing the patient characteristics described above.

$$V_3 = \widehat{\mathrm{Var}(\Theta)} = \left(1 - \frac{1}{n}\right) \widehat{M_2(\Theta)}$$

where

$$\widehat{M_2(\Theta)} = \left\{ \left(\begin{array}{c} \text{Predicted mortality} \\ \text{on basis of} \\ \text{patient characteristics and} \\ \text{adjustment for hospital effects} \end{array} \right) - \left(\begin{array}{c} \text{Predicted mortality} \\ \text{on basis of} \\ \text{patient characteristics,} \\ \text{but omitting the hospital specific effects} \end{array} \right) \right\}^2 \left(\frac{1}{z_p^2} \right)$$

The quantity z_p corresponds to the statistical significance (p-value) of the hospital-specific effect.

V_4 is the variation not explained by the mortality regression models which each include, in addition, an indicator variable for the hospital:

$$V_4 = \left\{ \left(\text{Observed mortality} \right) - \left(\begin{array}{c} \text{Predicted mortality} \\ \text{on basis of} \\ \text{patient characteristics, and} \\ \text{adjustment for the hospital specific effects} \end{array} \right) \right\}^2 .$$

(The regression coefficients of the indicator variable for the hospital are a measure of the influence on the probability of patient death of factors not otherwise specified in the model. These factors include severity of illness not adequately reported on by the patient characteristics deduced from the claims data and the hospital's pattern of practice; i.e., performance.)

The standard deviation given in the mortality tables is just

$$SD = \sqrt{V_2 + V_3 + V_4}.$$

Standardized Mortality Ratio (SMR)

Another method of evaluating a hospital's performance—the Standardized Mortality Ratio (SMR)—is obtained by dividing the observed mortality rate by the predicted mortality rate. An SMR of one means the observed and predicted mortality are equal. A ratio greater than one means the observed mortality exceeds the predicted. A ratio less than one means the observed mortality is less than expected. The more extreme the ratio (significantly greater than one indicating unusually high mortality and significantly less than one indicating unusually low mortality), the greater the attention which should be paid to the results of this mortality report.

For each of the conditions and procedures, selected percentiles for the observed distribution of the SMR are displayed in Table 4. The selected percentiles provide benchmarks for comparison. For example, for a hospital

with 300 cases in the "All Causes" category, with observed mortality of 12.2 percent and predicted probability of 10.0 percent at 30 days, the standardized mortality ratio is

SMR = 12.2/10.0 = 1.22.

Note that an SMR of one means the observed and predicted mortality are equal, while a ratio greater than one means the observed mortality exceeds the predicted, and a ratio less than one means the observed mortality is less than expected. There will be greater interest in the more extreme ratios, either greater than one — excessively high mortality — or less than one — extremely low mortality.

From Table 4 for FY 1990, we find that the ratio is just below the 75th percentile of 1.23. Hence, slightly under 75 percent of the hospitals have an SMR less than that found at this hospital.

However, for a hospital with 900 cases in the "All Causes" category, with observed mortality of 19.3 percent and predicted probability of 10.0 percent at 30 days, the standardized mortality ratio is

SMR = 19.3/10.0 = 1.93.

Since the SMR of 1.93 is greater than the 97.5 percentile of 1.35 (Table 4 for 750 or more cases), there is cause for concern. To further assess this, we examine the displayed data in terms of the measure of uncertainty, the standard deviation.

Measures of Uncertainty

In principle, to use the standard normal approximations to determine prediction intervals, an adjustment must be applied for the skewness and kurtosis inherent in a mortality rate when the rate is considerably less than 50 percent and the number of cases is small. Table 5 presents the multiplicative factors, based on the binomial distribution, for the standard deviation needed to construct prediction intervals for the mortality rates at confidence levels of 75, 95 and 99 percent. Because of the approximations involved in the estimation of the skewness and kurtosis corrections, their precision decreases as the number of cases and the mortality rate decrease; i.e., as the value of the correction increases. In addition, because of simplifications and approximations in the estimation of the standard deviation, the precision of the multiplicative factors given in Table 5 exceeds the precision of the estimate of the standard deviation. Hence, the following rule-of-thumb represents an adequate approximation to the factors in Table 5 and an adequate guide to the **statistical meaningfulness** of the difference between the observed and the predicted mortality rates.

To illustrate the use of Table 5, consider a hospital with 75 cases and a predicted mortality of 13.0 percent with a standard deviation of 5.0 percent. Overall, for hospitals with patients with characteristics similar to those of this hospital, we would expect the actual or observed mortality rate to lie, 95 percent of the time, either between 13.0 percent and 22.9 percent if the actual is larger than the predicted, or between 3.3 percent and 13.0 percent if the actual is less than the predicted. That is because 22.9 percent = 13.0 percent + 1.98 x 5.0 percent, the factor 1.98 having been read from the section of Table 5 with the heading "95 Percent Prediction Interval" and "Factor for Upper Bound," the row "75" for the number of cases, and, by interpolation, between the "10 percent" and the "20 percent" predicted mortality rate columns. Similarly, 3.3 percent = 13.0 percent - 1.94 x 5.0 percent, the factor -1.94 having been read from the section of Table 5 with the heading "95 Percent Prediction Interval" and "Factor for Lower Bound" and the corresponding row and columns.

Therefore, in comparing the actual and predicted rates, more attention should be given to the hospital whose observed mortality rate lies beyond the bounds calculated for the 99 percent prediction interval than to the hospital whose observed mortality rate lies only beyond the bounds calculated for the 95 percent prediction interval. Likewise, more attention should be given to that hospital than to the hospital whose observed mortality rate lies only beyond the bounds calculated for the 75 percent prediction interval.

For the graphs, the observed mortality and an approximate 95 percent prediction interval are displayed. The prediction interval has bounds at the predicted mortality plus 2 times the standard deviation and at the predicted minus 2 times the standard deviation.

In the mortality rate tables, the observed and predicted mortality rates and the standard deviation as a measure for statistical importance of the difference are displayed for the overall and each of the conditions and procedures.

How To Obtain Medicare Hospital Information

The publication has been widely distributed to State health organizations and hospital and medical associations. The publication is available to the public for purchase in 55 volumes, with each volume being sold separately through the Government Printing Office (GPO). More detailed information about the purchase of this publication may be obtained by contacting:

Superintendent of Documents
Government Printing Office
Washington, D.C. 20402
Telephone: (202) 783-3238

As in prior years, the information appearing in the Medicare Hospital Information report is available in machine-readable/electronic format (tape and diskette). The Medicare Hospital Information public use file provides the published information as contained in the 55-volume hardcopy publication, except that the AHA's hospital characteristics are not on this file. Hospital characteristics from HCFA files (OSCAR) are provided instead. The files contain additional information which is useful for supplemental analyses: averages by hospital, MSA, and State for each of the variables used in the model, mortality rates for 15, 30, 60, 90 and 180 days, and cross-reference files which relate State, MSA, and ICD-9-CM codes used to a name. These data should allow analysts to assess an individual hospital's performance in comparison to all hospitals in the State or applicable MSA.

Also available to **hospitals** in machine-readable format is their patient-specific data that were used in the report. These data include the patient variables used in the analysis (e.g., the number and severity level of prior hospitalizations considered by the methodology, admission source and type, etc.) and the predicted probability of death at each time interval for each individual included in the study. With these data it is possible for hospitals to better understand their statistics. **Due to confidentiality considerations, requests for patient-specific data must be forwarded on hospital letterhead, must include the institution's Medicare provider number, and must be signed by the hospital administrator.**

For information about obtaining Medicare Hospital Information electronic media data, please contact HCFA's Bureau of Data Management and Strategy at:

Health Care Financing Administration
Bureau of Data Management and Strategy
Office of Statistics and Data Management
3-A-10 Security Office Park Building
6325 Security Boulevard
Baltimore, Maryland 21207
Telephone: (410) 597-5151

Table 1

DIAGNOSTIC AND PROCEDURE CATEGORIES

The following lists the ICD-9-CM diagnostic and procedure codes used to classify and group patients for presentation

CONDITION/PROCEDURE	ICD-9-CM CODES *(D)=Diagnosis code* *(P)=Procedure code*
Heart Disorders/Procedures	
Acute Myocardial Infarction (AMI)	All of 410 (D) (on 10/1/89 exclude 410 with 5th digit of a 2)
Note: *For code 410 a 5th digit was added on October 1, 1989.*	
Congestive Heart Failure (CHF)	398.91, 402.01, 402.11, 402.91, 428.0, 428.1, 428.9 (all D)
Angioplasty (ANGPLSTY)	All of 36.0 (P) excluding 36.00, 36.03, 36.04, 36.09 (all P)
Note: *Code 36.0 had a 4th digit added on October 1, 1986. Code 36.0 got digits of 0, 1, 2, 3, and 9, and code 36.04 got some previously coded cases of 39.97. On October 1, 1987, code 36.01 was divided into 36.01 and 36.05, and some cases from 36.02 were put into 36.05.*	
Coronary Artery Bypass Graft (CABG)	All of 36.1(P) and not Angioplasty (see above)
Pacemaker Insertion, Initial (PACE)	37.73, 37.74, 37.75, 37.77 (after 10/1/87 use 37.70 through 37.73) (all P)
Note: *Code 37.70 was restructured on October 1, 1987. Previously the code contained both leads and devices. On October 1 these were separated and devices were coded as 37.80 through 37.83, and codes for the leads were changed into various 37.70 codes.*	

CONDITION/PROCEDURE	ICD-9-CM CODES *(D)=Diagnosis code* *(P)=Procedure code*
Pulmonary Disorders	
Pneumonia/Influenza (PNU)	All of 480, all of 481, 482.2, 482.3, 482.9, 483, 485, 486, 487.0 (all D)
Chronic Obstructive Pulmonary (COPD)	All of 491, all of 492, all of 494, Disease all of 496; and 466.0, 518.82, 518.5, and 786.09 when there is a secondary diagnosis of any 496 (all D)

Note: *Code 518.8 got a 5th digit on October l, 1987. Some cases from 799.1 were put into codes 518.81 and 518.82.*

Cerebrovascular Disorders/Procedures	
Transient Cerebral Ischemia (TCI)	433.1, 433.3, 435 (D) and exclude those patients with an endarterectomy at the time of admission—38.12(P)
Stroke (STK)	431, 434 through 434.9, 436 (all D)
Carotid Endarterectomy (ENDART)	38.12 (P) with 433.1 (D); 433.3 (D) or 435(D) as a principal diagnosis
Musculoskeletal Disorders/Procedures	
Fracture of Neck of Femur (FXHIP)	All of 820 (D)
Hip Replacement/Revision (HIPREP)	81.5, 81.6 (exclude 81.69) (all P). On 10/1/89 code 81.51 (P) through 81.53 (P) with same diagnoses.
Open Reduction of Fractured Femur (OPRDUX)	79.35(P) on condition of 820 (D) as principal diagnosis

CONDITION/PROCEDURE	ICD-9-CM CODES *(D)=Diagnosis code* *(P)=Procedure code*
Genitourinary Disorders/Procedures	
Prostatectomy (PROS)	60.2, 60.3 through 60.69 (all P)
Hysterectomy (HYS)	68.3 through 68.7 (P)
Gastrointestinal Disorders/Procedures	
Cholecystectomy (CHOLOTMY)	51.22 (P)
Sepsis	
Sepsis	003.1, 020.2, 022.3, 036.2, 036.3, 036.89, 036.9, 038.0, 038.1, 038.2, 038.3, 038.40, 038.41, 038.42, 038.43, 038.44, 038.49, 038.8, 038.9, 054.5

Table 2

COMORBIDITY CONDITIONS

(all are D codes)

COMORBIDITY	ICD-9-CM CODES
Cancer	141-160.9, 162-172.9, 174-208.91
Chronic cardiovascular disease	412-414.9, 426-429.1
Chronic liver disease	571-572.8
Chronic renal disease	582-583.9, 585-587, 403.01, 403.11, 403.91, 404.02, 404.03, 404.12, 404.13, 404.92, 404.93
Chronic diabetes	250.01, 250.1-250.91
Chronic pulmonary disease	491-493.91, 496
Cerebrovascular degeneration	290-290.9, 294-299.9

Table 3

EXPLANATORY VARIABLES FOR THE MORTALITY MODEL

Generally the same variables are used for all diagnostic categories.

Demographics

SXFM An indicator variable: = 1 if Female, 0 otherwise

AGEFM = AGESP if SXFM = 1, 0 otherwise
AGEML = AGESP if SXFM = 0, 0 otherwise

where

$$AGESP = \text{sign}(W-65)\left(\left|\frac{W-65}{65}\right|\right)^{1.44}$$

and

$$W = \left\{ \begin{array}{c} 23 \text{ if } AGE \leq 23 \\ AGE \text{ if } 23 < AGE < 100 \\ 100 \text{ if } 100 \leq AGE \end{array} \right\}$$

Comorbidities		**ICD-9-CM Codes**
(Indicator variables = 1 if comorbidity present on current or prior admission with discharge within 6 months prior to current admission, 0 otherwise)		
CCA	Cancer	141-160.9, 162-172.9, 174-208.91
CCV	Chronic cardiovascular disease	412-414.9, 426-429.1
CLV	Chronic liver disease	571-572.8
CRN	Chronic renal disease	582-583.9, 585-587, 403.01, 403.11, 403.91, 404.02, 404.03, 404.12, 404.13, 404.92, 404.93
CDI	Chronic diabetes	250.01, 250.1-250.91
COP	Chronic pulmonary disease	491-493.91, 496
CCE	Cerebrovascular degeneration	290-290.9, 294-299.9

Co Occurrence of Comorbidities

COP_CCV	1 if COP = 1 and CCV = 1, 0 otherwise
CCA_CCV	1 if CCA = 1 and CCV = 1, 0 otherwise
COP_CCA	1 if COP = 1 and CCA = 1, 0 otherwise
CCE_CCV	1 if CCE = 1 and CCV = 1, 0 otherwise
CRN_CCV	1 if CRN = 1 and CCV = 1, 0 otherwise

Admission Sources and Types

(Indicator variables = 1 if source or type present, 0 otherwise)

PREF	Patient referred by personal or HMO physician
TRSNF	Patient transferred from skilled nursing facility
ELCT	Patient admitted for elective procedure
EMRG	Patient admitted for emergency

Co-Occurrence of Admission Source and Type

PREF_ELEC = 1 if PREF = 1 and ELCT = 1, 0 otherwise

Previous Hospitalizations

P_RISK1	Number at 1st risk level with 3 or more set to 3
P_RISK2	Number at 2nd risk level with 3 or more set to 3
P_RISK3	Number at 3rd risk level with 3 or more set to 3
P_RISK4	Number at 4th risk level with 4 or more set to 4
P_RISK5	Number at 5th risk level with 3 or more set to 3
F(T)	Probability of death from previous admission if discharge within 182 days of current admission, 0 otherwise

Time Trend

FLAG89	1 if discharge in FY1989, 0 otherwise
FLAG90	1 if discharge in FY1990, 0 otherwise
INYEAR	Difference between current admission date and April 1 of fiscal year of discharge

TABLE 4
SMR DISTRIBUTION FOR HOSPITALS WITH GREATER THAN 50 CASES
1990 STUDY, FY1990

CONDITIONS/PROCEDURES	NUMBER OF HOSPITALS	30 DAYS					90 DAYS					180 DAYS				
		2.5%	25%	50%	75%	97.5%	2.5%	25%	50%	75%	97.5%	2.5%	25%	50%	75%	97.5%
OVERALL(< 750 CASES)	2645	0.45	0.88	1.04	1.23	1.72	0.56	0.90	1.03	1.17	1.54	0.61	0.90	1.02	1.15	1.46
OVERALL(>= 750 CASES)	2684	0.73	0.91	0.99	1.09	1.35	0.79	0.94	1.01	1.09	1.28	0.82	0.94	1.01	1.08	1.24
CONDITIONS																
AMI	1405	0.54	0.80	0.95	1.11	1.42	0.62	0.86	0.99	1.14	1.44	0.63	0.86	0.99	1.13	1.39
CHF	2335	0.43	0.79	0.98	1.17	1.64	0.60	0.85	0.99	1.13	1.49	0.66	0.89	1.00	1.13	1.41
PNEUMONIA/INFLUENZA	2428	0.41	0.78	0.97	1.18	1.68	0.53	0.84	1.00	1.17	1.55	0.57	0.86	1.01	1.16	1.50
COPD	435	0.00	0.63	0.97	1.34	2.06	0.30	0.78	1.02	1.26	1.74	0.40	0.82	1.01	1.24	1.69
TRANS. CEREBRAL ISCHEMIA	404	0.00	0.00	0.83	1.34	3.20	0.00	0.48	0.85	1.31	2.27	0.21	0.60	0.90	1.21	2.05
STROKE	1789	0.53	0.79	0.95	1.13	1.56	0.61	0.84	0.98	1.13	1.47	0.65	0.87	0.99	1.12	1.42
HIP FRACTURE	1199	0.21	0.67	0.93	1.27	2.10	0.40	0.76	0.94	1.19	1.80	0.47	0.78	0.97	1.16	1.64
SEPSIS	254	0.51	0.79	0.96	1.12	1.50	0.65	0.86	0.99	1.13	1.47	0.69	0.89	1.01	1.15	1.44
PROCEDURES																
ANGIOPLASTY	425	0.00	0.49	0.89	1.33	2.66	0.00	0.60	0.93	1.36	2.34	0.00	0.63	0.97	1.34	2.14
CABG	556	0.20	0.68	1.03	1.39	2.45	0.28	0.73	1.00	1.32	2.09	0.28	0.73	1.01	1.30	2.10
PACEMAKER	112	0.00	0.41	0.72	1.37	3.25	0.20	0.61	0.90	1.21	2.17	0.21	0.65	0.84	1.16	1.87
CAROTID ENDARTERECTOMY	73	0.00	0.00	0.85	1.33	2.90	0.00	0.14	0.74	1.28	2.43	0.00	0.42	0.86	1.38	2.86
HIP REPLACEMENT	763	0.00	0.53	0.94	1.44	2.77	0.19	0.67	0.96	1.31	2.12	0.26	0.71	0.94	1.26	1.91
REDUCT. OF HIP FRACTURE	276	0.00	0.56	0.86	1.22	2.05	0.31	0.68	0.92	1.19	1.76	0.38	0.77	0.96	1.12	1.58
PROSTATECTOMY	1576	0.00	0.00	0.73	1.57	3.56	0.00	0.49	0.91	1.40	2.63	0.00	0.57	0.92	1.29	2.21
CHOLECYSTECTOMY	714	0.00	0.49	0.95	1.54	2.68	0.00	0.62	0.93	1.37	2.22	0.22	0.67	0.98	1.27	1.93
HYSTERECTOMY	113	0.00	0.00	0.00	2.00	6.69	0.00	0.00	0.76	1.70	3.59	0.00	0.24	0.75	1.27	2.91

TABLE 4
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1990 STUDY, FY1989

CONDITIONS/PROCEDURES	NUMBER OF HOSPITALS	30 DAYS					90 DAYS					180 DAYS				
		2.5%	25%	50%	75%	97.5%	2.5%	25%	50%	75%	97.5%	2.5%	25%	50%	75%	97.5%
OVERALL(< 750 CASES)	2746	0.50	0.87	1.04	1.23	1.73	0.58	0.89	1.03	1.17	1.54	0.61	0.89	1.01	1.14	1.44
OVERALL(>= 750 CASES)	2669	0.71	0.90	1.00	1.09	1.35	0.79	0.94	1.01	1.08	1.28	0.82	0.95	1.01	1.07	1.24
CONDITIONS																
AMI	1412	0.53	0.81	0.96	1.12	1.47	0.59	0.86	1.01	1.15	1.47	0.63	0.87	1.00	1.14	1.43
CHF	2293	0.47	0.80	0.97	1.18	1.69	0.58	0.86	1.00	1.14	1.48	0.66	0.89	1.02	1.14	1.40
PNEUMONIA/INFLUENZA	2179	0.45	0.77	0.97	1.19	1.67	0.54	0.85	1.01	1.18	1.55	0.60	0.86	1.02	1.18	1.51
COPD	324	0.21	0.68	0.99	1.32	2.13	0.44	0.78	1.04	1.27	1.91	0.49	0.84	1.04	1.24	1.66
TRANS. CEREBRAL ISCHEMIA	420	0.00	0.00	0.79	1.41	3.26	0.00	0.46	0.88	1.33	2.36	0.18	0.60	0.92	1.25	1.97
STROKE	1728	0.53	0.80	0.95	1.12	1.56	0.62	0.85	0.97	1.11	1.46	0.67	0.88	0.99	1.13	1.40
HIP FRACTURE	1126	0.24	0.67	0.95	1.30	2.04	0.39	0.75	0.98	1.21	1.71	0.46	0.78	0.97	1.18	1.59
SEPSIS	174	0.52	0.79	0.94	1.10	1.52	0.63	0.88	1.02	1.15	1.46	0.68	0.93	1.05	1.16	1.43
PROCEDURES																
ANGIOPLASTY	370	0.00	0.46	0.84	1.35	2.55	0.00	0.55	0.88	1.33	2.52	0.00	0.61	0.94	1.32	2.44
CABG	501	0.21	0.65	1.00	1.47	2.57	0.23	0.69	1.00	1.33	2.29	0.32	0.74	1.01	1.33	2.21
PACEMAKER	91	0.00	0.52	0.74	1.12	2.31	0.00	0.56	0.83	1.15	2.14	0.20	0.68	0.81	1.16	1.87
CAROTID ENDARTERECTOMY	55	0.00	0.00	0.82	1.51	5.01	0.00	0.47	0.86	1.31	4.00	0.00	0.43	0.85	1.28	3.12
HIP REPLACEMENT	686	0.00	0.52	0.92	1.44	2.46	0.00	0.65	0.94	1.27	1.95	0.21	0.67	0.94	1.19	1.75
REDUCT. OF HIP FRACTURE	246	0.19	0.57	0.91	1.23	1.96	0.31	0.71	0.96	1.19	1.74	0.41	0.78	0.96	1.13	1.53
PROSTATECTOMY	1570	0.00	0.00	0.67	1.50	3.46	0.00	0.47	0.86	1.36	2.67	0.00	0.58	0.93	1.28	2.15
CHOLECYSTECTOMY	680	0.00	0.53	0.94	1.53	2.90	0.00	0.62	0.97	1.36	2.15	0.22	0.66	0.95	1.26	1.98
HYSTERECTOMY	101	0.00	0.00	0.00	1.80	5.44	0.00	0.00	0.78	1.60	4.21	0.00	0.00	0.91	1.38	2.99

TABLE 4
SMR DISTRIBUTION FOR HOSPITALS WITH GREATER THAN 50 CASES
1990 STUDY, FY1988

CONDITIONS/PROCEDURES	NUMBER OF HOSPITALS	30 DAYS					90 DAYS					180 DAYS				
		2.5%	25%	50%	75%	97.5%	2.5%	25%	50%	75%	97.5%	2.5%	25%	50%	75%	97.5%
OVERALL(< 750 CASES)	2838	0.46	0.89	1.05	1.23	1.75	0.54	0.90	1.03	1.16	1.57	0.59	0.90	1.02	1.14	1.45
OVERALL(>= 750 CASES)	2693	0.73	0.90	1.00	1.10	1.35	0.79	0.94	1.01	1.09	1.27	0.82	0.95	1.01	1.08	1.24
CONDITIONS																
AMI	1414	0.56	0.82	0.96	1.12	1.41	0.63	0.87	1.01	1.14	1.42	0.65	0.89	1.00	1.13	1.39
CHF	2246	0.45	0.79	0.97	1.18	1.61	0.60	0.86	1.00	1.14	1.43	0.68	0.90	1.02	1.13	1.37
PNEUMONIA/INFLUENZA	2069	0.44	0.79	0.97	1.17	1.68	0.57	0.85	1.01	1.17	1.59	0.61	0.87	1.01	1.16	1.53
COPD	310	0.21	0.67	0.92	1.30	2.17	0.39	0.79	0.98	1.20	1.81	0.51	0.82	0.99	1.19	1.59
TRANS. CEREBRAL ISCHEMIA	495	0.00	0.00	0.84	1.48	2.94	0.00	0.48	0.92	1.39	2.28	0.21	0.60	0.92	1.27	1.92
STROKE	1726	0.51	0.79	0.95	1.12	1.56	0.60	0.84	0.98	1.13	1.44	0.64	0.88	1.00	1.13	1.42
HIP FRACTURE	1119	0.24	0.65	0.96	1.27	2.07	0.40	0.78	0.98	1.21	1.77	0.47	0.80	0.98	1.17	1.64
SEPSIS	133	0.58	0.77	0.92	1.08	1.64	0.56	0.86	1.00	1.13	1.54	0.67	0.88	1.02	1.14	1.53
PROCEDURES																
ANGIOPLASTY	297	0.00	0.50	0.87	1.35	2.60	0.00	0.59	0.91	1.34	2.50	0.00	0.65	0.95	1.31	2.25
CABG	478	0.21	0.68	0.98	1.39	2.40	0.32	0.73	1.00	1.36	2.12	0.38	0.75	1.01	1.31	2.04
PACEMAKER	83	0.00	0.34	0.65	1.04	1.75	0.01	0.54	0.85	1.03	1.70	0.23	0.69	0.87	1.10	1.57
CAROTID ENDARTERECTOMY	69	0.00	0.00	0.60	1.23	3.30	0.00	0.33	0.62	1.09	2.50	0.00	0.44	0.68	1.16	1.87
HIP REPLACEMENT	670	0.00	0.49	0.95	1.40	2.65	0.00	0.66	1.01	1.31	2.15	0.24	0.70	0.96	1.24	1.87
REDUCT. OF HIP FRACTURE	259	0.00	0.61	0.91	1.26	2.16	0.38	0.74	0.96	1.21	1.94	0.44	0.77	0.96	1.16	1.79
PROSTATECTOMY	1619	0.00	0.00	0.78	1.53	3.69	0.00	0.54	0.92	1.39	2.57	0.00	0.61	0.93	1.30	2.21
CHOLECYSTECTOMY	642	0.00	0.50	0.96	1.44	3.04	0.00	0.61	0.96	1.36	2.26	0.25	0.66	0.96	1.27	2.01
HYSTERECTOMY	90	0.00	0.00	0.00	1.57	5.00	0.00	0.00	0.68	1.43	2.83	0.00	0.28	0.67	1.15	2.88

TABLE 5: MULTIPLICATIVE FACTORS FOR THE CALCULATION OF THE BOUNDS FOR PREDICTION INTERVALS

(n is the number of cases at your hospital and p is the predicted mortality rate)

	99% Prediction Interval					95% Prediction Interval					75% Prediction Interval				
	Factor for Upper Bound					Factor for Upper Bound					Factor for Upper Bound				
p	1%	5%	10%	20%	40%	1%	5%	10%	20%	40%	1%	5%	10%	20%	40%
n															
25	2.95	2.73	2.68	2.63	2.59	2.15	2.04	2.01	1.99	1.97	1.17	1.16	1.16	1.15	1.15
50	2.76	2.65	2.63	2.60	2.58	2.05	2.00	1.99	1.97	1.96	1.16	1.15	1.15	1.15	1.15
75	2.70	2.63	2.61	2.59	2.58	2.02	1.99	1.98	1.97	1.96	1.16	1.15	1.15	1.15	1.15
100	2.67	2.61	2.60	2.59	2.58	2.01	1.98	1.97	1.97	1.96	1.16	1.15	1.15	1.15	1.15
150	2.64	2.60	2.59	2.59	2.58	1.99	1.97	1.97	1.96	1.96	1.15	1.15	1.15	1.15	1.15
200	2.62	2.60	2.59	2.58	2.58	1.98	1.97	1.97	1.96	1.96	1.15	1.15	1.15	1.15	1.15
300	2.61	2.59	2.58	2.58	2.58	1.98	1.97	1.96	1.96	1.96	1.15	1.15	1.15	1.15	1.15
400	2.60	2.59	2.58	2.58	2.58	1.97	1.96	1.96	1.96	1.96	1.15	1.15	1.15	1.15	1.15
500	2.59	2.58	2.58	2.58	2.58	1.97	1.96	1.96	1.96	1.96	1.15	1.15	1.15	1.15	1.15
750	2.59	2.58	2.58	2.58	2.58	1.97	1.96	1.96	1.96	1.96	1.15	1.15	1.15	1.15	1.15
1000	2.59	2.58	2.58	2.58	2.58	1.96	1.96	1.96	1.96	1.96	1.15	1.15	1.15	1.15	1.15
2000	2.58	2.58	2.58	2.58	2.58	1.96	1.96	1.96	1.96	1.96	1.15	1.15	1.15	1.15	1.15
5000	2.58	2.58	2.58	2.58	2.58	1.96	1.96	1.96	1.96	1.96	1.15	1.15	1.15	1.15	1.15
	Factor for Lower Bound					Factor for Lower Bound					Factor for Lower Bound				
p	1%	5%	10%	20%	40%	1%	5%	10%	20%	40%	1%	5%	10%	20%	40%
n															
25	-2.21	-2.42	-2.48	-2.52	-2.56	-1.77	-1.88	-1.91	-1.93	-1.95	-1.13	-1.14	-1.14	-1.15	-1.15
50	-2.39	-2.50	-2.53	-2.55	-2.57	-1.87	-1.92	-1.93	-1.95	-1.96	-1.14	-1.15	-1.15	-1.15	-1.15
75	-2.45	-2.52	-2.54	-2.56	-2.57	-1.90	-1.93	-1.94	-1.95	-1.96	-1.14	-1.15	-1.15	-1.15	-1.15
100	-2.48	-2.54	-2.55	-2.56	-2.57	-1.91	-1.94	-1.95	-1.95	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
150	-2.51	-2.55	-2.56	-2.57	-2.57	-1.93	-1.95	-1.95	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
200	-2.53	-2.56	-2.56	-2.57	-2.57	-1.94	-1.95	-1.95	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
300	-2.54	-2.56	-2.57	-2.57	-2.57	-1.94	-1.95	-1.96	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
400	-2.55	-2.57	-2.57	-2.57	-2.57	-1.95	-1.96	-1.96	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
500	-2.56	-2.57	-2.57	-2.57	-2.58	-1.95	-1.96	-1.96	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
750	-2.56	-2.57	-2.57	-2.57	-2.58	-1.95	-1.96	-1.96	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
1000	-2.57	-2.57	-2.57	-2.57	-2.58	-1.96	-1.96	-1.96	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
2000	-2.57	-2.57	-2.57	-2.58	-2.58	-1.96	-1.96	-1.96	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15
5000	-2.57	-2.58	-2.58	-2.58	-2.58	-1.96	-1.96	-1.96	-1.96	-1.96	-1.15	-1.15	-1.15	-1.15	-1.15

Medicare Hospital Information

BEEBE MEDICAL CENTER

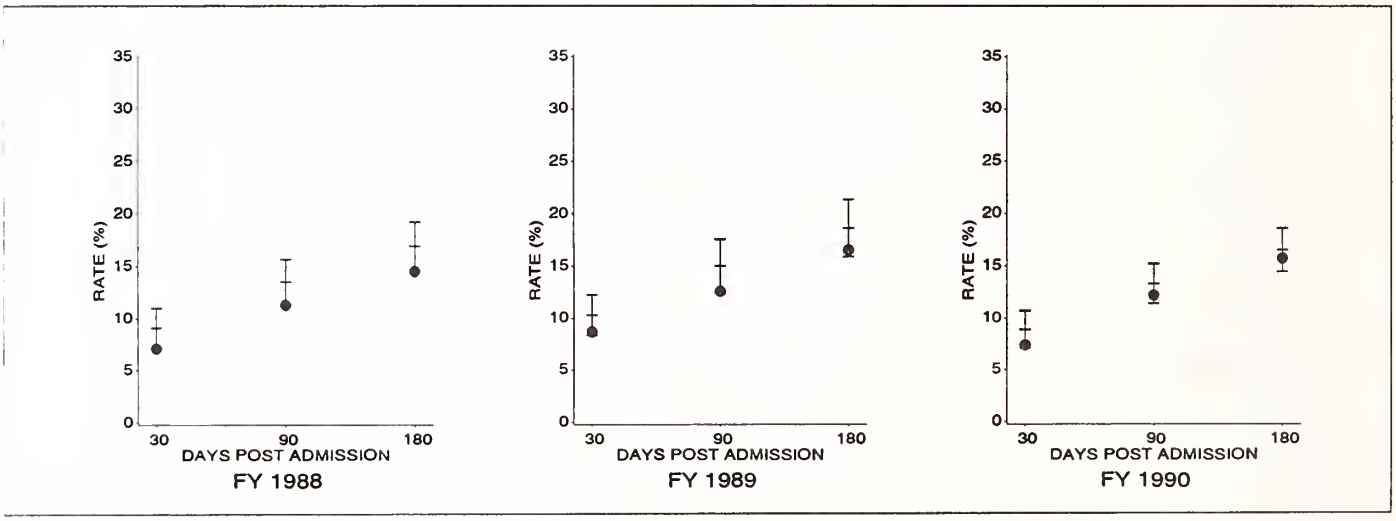
424 SAVANNAH RD
LEWES, DE 19958
Medicare Provider Number: 080007

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%)								
		30 DAYS			90 DAYS			180 DAYS		
		OBS	PRED	SD*	OBS	PRED	SD*	OBS	PRED	SD*
ALL CAUSES	1581	7.4	8.9	0.9	12.2	13.3	1.0	15.7	16.5	1.0
CONDITIONS:										
Acute Myocardial Infarction	64	29.7	24.8	9.2	32.8	27.8	8.8	34.4	30.6	7.5
Congestive Heart Failure	73	11.0	14.5	4.7	19.2	22.8	5.7	32.9	29.0	5.7
Pneumonia/Influenza	60	10.0	13.1	5.3	16.7	18.1	6.3	18.3	21.7	7.4
Chronic Obstructive Pulmonary Disease	38	5.3	8.8	-----	7.9	14.8	-----	10.5	19.1	-----
Transient Cerebral Ischemia	20	0.0	1.5	-----	0.0	3.4	-----	0.0	5.5	-----
Stroke	57	19.3	15.4	5.8	21.1	20.4	6.7	22.8	23.9	6.2
Hip Fracture	37	2.7	4.9	-----	13.5	9.0	-----	16.2	12.1	-----
Sepsis	24	20.8	28.2	-----	29.2	35.6	-----	33.3	40.1	-----
PROCEDURES:										
Angioplasty	0									
Coronary Artery Bypass Graft	0									
Initial Pacemaker Insertion	14	0.0	3.6	-----	7.1	6.6	-----	7.1	9.2	-----
Carotid Endarterectomy	3	0.0	1.2	-----	0.0	2.4	-----	0.0	3.9	-----
Hip Replacement/Reconstruction	25	0.0	2.2	-----	0.0	4.3	-----	0.0	6.1	-----
Open Reduction of Hip Fracture	24	4.2	5.0	-----	20.8	9.6	-----	25.0	13.0	-----
Prostatectomy	51	0.0	1.0	1.7	3.9	2.3	3.3	3.9	3.8	4.0
Cholecystectomy	37	2.7	2.7	-----	2.7	4.4	-----	2.7	5.5	-----
Hysterectomy	9	0.0	0.3	-----	0.0	0.7	-----	0.0	1.2	-----

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

OBSERVED MORTALITY RATE (•) AND PREDICTED RANGE (± 2 SD) FOR MEDICARE PATIENT ADMISSIONS FOR ALL CAUSES



BEEBE MEDICAL CENTER
Medicare Provider Number: 080007

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	73.7 years
Proportion female	54.3 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	22.4 %
Transferred from skilled nursing facility	0.3 %
Admitted for elective procedure	0.0 %
Admitted for emergency	12.5 %

COMORBIDITIES:

Cancer	5.6 %
Chronic cardiovascular disease	43.1 %
Chronic liver disease	1.1 %
Chronic renal disease	3.1 %
Chronic pulmonary disease	16.3 %
Cerebrovascular degeneration	2.5 %
Diabetes mellitus	8.2 %

ORIGIN AND LENGTH OF STAY OF MEDICARE ADMISSIONS*

ORIGIN OF MEDICARE PATIENT ADMISSION:

County/City	88.5%
State	4.2%
Outside State	7.3%
Total	100.0%

MEDICARE AVERAGE LENGTH OF STAY:

Hospital	7.4 Days
State	9.0 Days
National	8.6 Days

HOSPITAL CHARACTERISTICS*

SOURCE: AHA Annual Survey of Hospitals** - Survey Year 1990

PROFILE:

Total Beds	138
Occupancy Rate	71.0 %
Ownership.Control	Private, Non-Profit
Medicare Discharges	44.0 %
Case Mix Index (CMI)	1.1768

STAFFING:

Total Number of Physicians	54
Percent of Physicians Board Certified Specialists	64.8 %
Medical Residents/Interns	0
Registered Nurses	121
Licensed Practical Nurses	17

SPECIALTY SERVICES:

Burn Unit	No
Cardiac Intensive Care	No
Comprehensive Geriatric	No
Hospice Care	No
Medical/Surgical Intensive Care	Yes
Organ/Tissue Transplant	No
Other Intensive Care	No
Trauma Center	No

OTHER SPECIALTY/HOSPITAL-BASED SERVICES:

Alcohol/Drug	No
Rehabilitation	No
Psychiatric	Yes
Medicare Swing Beds	No

** Except for CMI

*** Not used in calculating mortality rates**

KENT GENERAL HOSPITAL INC

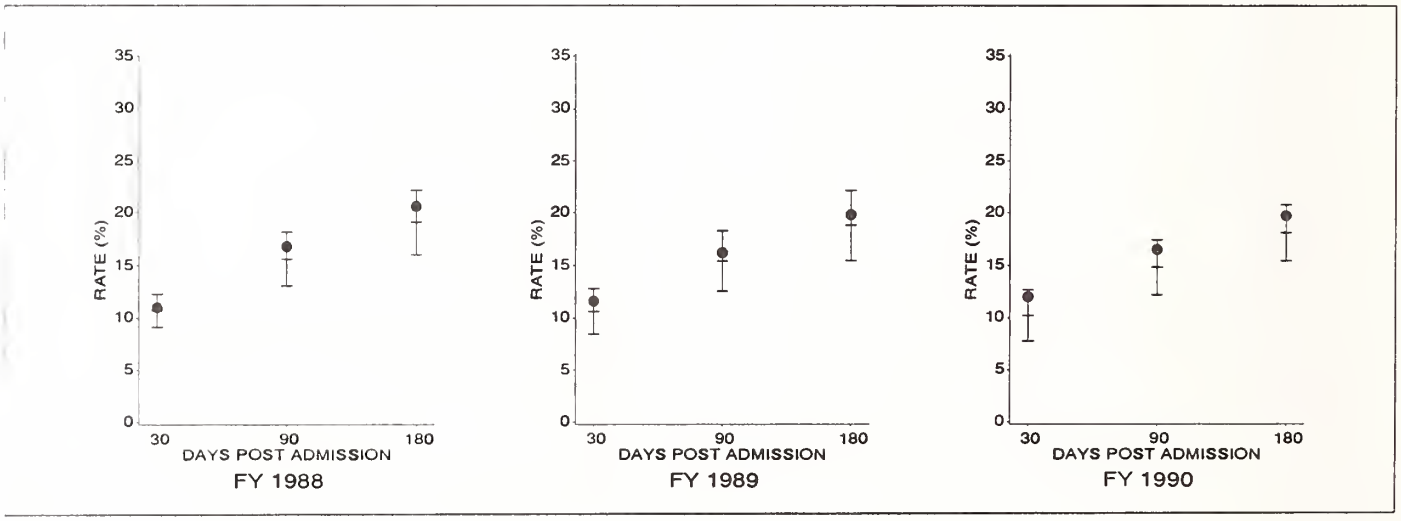
640 S STATE STREET
DOVER, DE 19901
Medicare Provider Number: 080004

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%)								
		30 DAYS			90 DAYS			180 DAYS		
		OBS	PRED	SD*	OBS	PRED	SD*	OBS	PRED	SD*
ALL CAUSES	1923	12.0	10.2	1.2	16.5	14.8	1.3	19.7	18.1	1.3
CONDITIONS:										
Acute Myocardial Infarction	86	27.9	27.2	4.8	30.2	30.0	5.0	32.6	32.6	5.3
Congestive Heart Failure	96	16.7	13.6	4.5	21.9	21.5	4.3	26.0	27.7	5.2
Pneumonia/Influenza	110	19.1	16.1	4.6	25.5	22.1	6.4	29.1	26.1	6.6
Chronic Obstructive Pulmonary Disease	22	18.2	7.5	-----	27.3	12.4	-----	27.3	16.5	-----
Transient Cerebral Ischemia	18	0.0	1.8	-----	0.0	3.8	-----	0.0	6.0	-----
Stroke	83	30.1	20.0	6.7	37.3	26.1	8.0	42.2	29.7	8.5
Hip Fracture	49	10.2	6.0	-----	14.3	10.4	-----	22.4	13.4	-----
Sepsis	31	22.6	24.4	-----	29.0	33.8	-----	32.3	38.9	-----
PROCEDURES:										
Angioplasty	0									
Coronary Artery Bypass Graft	0									
Initial Pacemaker Insertion	25	28.0	6.2	-----	32.0	11.4	-----	32.0	15.2	-----
Carotid Endarterectomy	8	0.0	1.8	-----	0.0	3.2	-----	0.0	4.5	-----
Hip Replacement/Reconstruction	35	5.7	3.3	-----	5.7	6.0	-----	11.4	8.3	-----
Open Reduction of Hip Fracture	19	15.8	5.9	-----	21.1	10.3	-----	26.3	13.2	-----
Prostatectomy	96	0.0	1.1	1.5	1.0	2.4	2.1	2.1	4.1	2.7
Cholecystectomy	23	4.3	1.4	-----	4.3	2.6	-----	4.3	3.6	-----
Hysterectomy	13	0.0	0.7	-----	0.0	1.6	-----	0.0	2.5	-----

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

OBSERVED MORTALITY RATE (•) AND PREDICTED RANGE (± 2 SD) FOR MEDICARE PATIENT ADMISSIONS FOR ALL CAUSES



KENT GENERAL HOSPITAL INC

Medicare Provider Number: 080004

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	74.1 years
Proportion female	53.4 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	36.8 %
Transferred from skilled nursing facility	0.1 %
Admitted for elective procedure	0.1 %
Admitted for emergency	63.4 %

COMORBIDITIES:

Cancer	4.2 %
Chronic cardiovascular disease	28.9 %
Chronic liver disease	0.6 %
Chronic renal disease	6.3 %
Chronic pulmonary disease	11.9 %
Cerebrovascular degeneration	3.7 %
Diabetes mellitus	8.3 %

ORIGIN AND LENGTH OF STAY OF MEDICARE ADMISSIONS*

ORIGIN OF MEDICARE PATIENT ADMISSION:

County/City	77.0%
State	16.7%
Outside State	6.3%
Total	100.0%

MEDICARE AVERAGE LENGTH OF STAY:

Hospital	8.0 Days
State	9.0 Days
National	8.6 Days

HOSPITAL CHARACTERISTICS*

SOURCE: AHA Annual Survey of Hospitals** - Survey Year 1990

PROFILE:

Total Beds	193
Occupancy Rate	79.0 %
Ownership.Control	Private, Non-Profit
Medicare Discharges	33.4 %
Case Mix Index (CMI)	1.2558

STAFFING:

Total Number of Physicians	87
Percent of Physicians Board Certified Specialists	81.6 %
Medical Residents/Interns	0
Registered Nurses	300
Licensed Practical Nurses	74

SPECIALTY SERVICES:

Burn Unit	No
Cardiac Intensive Care	Yes
Comprehensive Geriatric	No
Hospice Care	No
Medical/Surgical Intensive Care	Yes
Organ/Tissue Transplant	No
Other Intensive Care	No
Trauma Center	No

OTHER SPECIALTY/HOSPITAL-BASED SERVICES:

Alcohol/Drug	No
Rehabilitation	No
Psychiatric	Yes
Medicare Swing Beds	No

** Except for CMI

* Not used in calculating mortality rates

MEDICAL CENTER OF DELAWARE

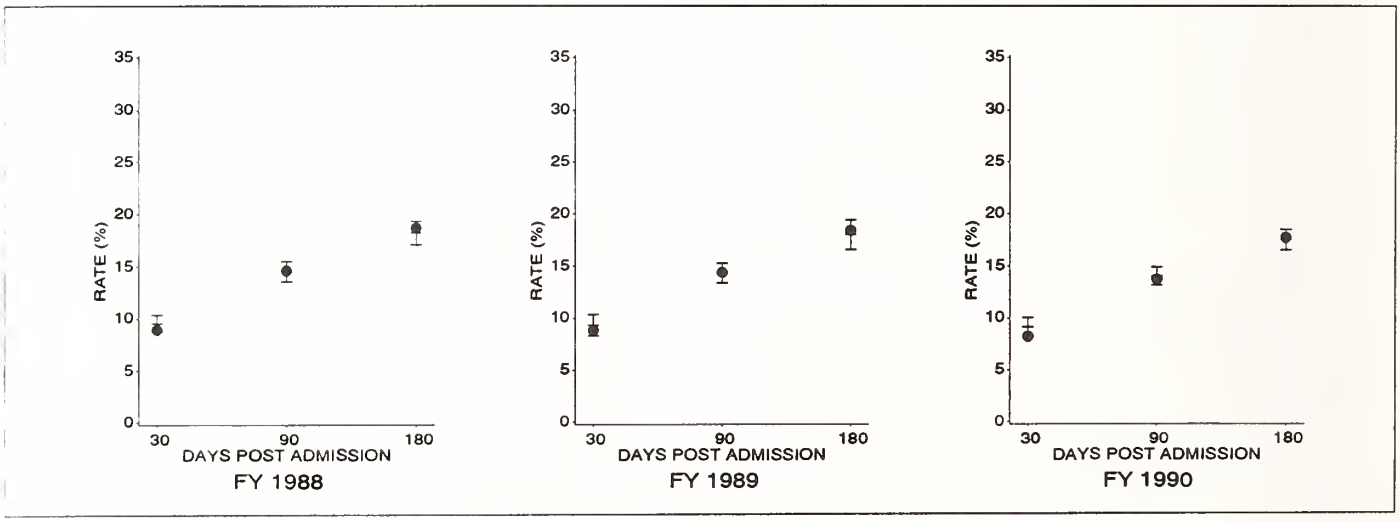
PO BOX 1668
WILMINGTON, DE 19899
Medicare Provider Number: 080001

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%)								
		30 DAYS			90 DAYS			180 DAYS		
		OBS	PRED	SD*	OBS	PRED	SD*	OBS	PRED	SD*
ALL CAUSES	6247	8.2	9.1	0.5	13.7	14.0	0.4	17.7	17.5	0.5
CONDITIONS:										
Acute Myocardial Infarction	256	20.7	22.4	4.5	23.4	25.8	4.0	29.3	28.7	4.4
Congestive Heart Failure	269	13.0	13.4	2.3	19.7	21.4	3.0	26.0	27.3	3.4
Pneumonia/Influenza	204	14.2	14.9	2.5	19.6	20.5	3.9	24.5	24.1	4.0
Chronic Obstructive Pulmonary Disease	50	10.0	8.4	-----	18.0	14.8	-----	22.0	19.3	-----
Transient Cerebral Ischemia	62	1.6	1.6	2.1	4.8	3.6	4.2	9.7	5.8	6.1
Stroke	207	18.8	20.1	3.1	24.6	25.9	3.2	30.0	29.4	3.3
Hip Fracture	149	5.4	6.5	2.8	8.7	11.4	4.1	12.8	14.8	4.7
Sepsis	121	24.8	25.7	4.2	34.7	35.2	4.4	40.5	40.2	4.6
PROCEDURES:										
Angioplasty	119	0.0	2.9	2.0	0.8	4.0	2.4	1.7	5.0	2.8
Coronary Artery Bypass Graft	165	4.8	6.6	2.5	8.5	9.4	2.4	10.3	10.7	2.5
Initial Pacemaker Insertion	43	4.7	3.2	-----	7.0	6.1	-----	14.0	8.4	-----
Carotid Endarterectomy	38	2.6	1.3	-----	7.9	2.4	-----	7.9	3.5	-----
Hip Replacement/Reconstruction	115	5.2	3.8	2.3	7.8	7.2	2.5	11.3	9.8	3.0
Open Reduction of Hip Fracture	77	3.9	5.6	3.2	6.5	10.2	5.1	9.1	13.5	5.9
Prostatectomy	172	0.0	0.7	1.2	1.2	1.7	1.4	2.9	2.9	1.4
Cholecystectomy	108	1.9	2.7	1.7	6.5	5.5	2.3	10.2	7.7	3.0
Hysterectomy	54	5.6	0.7	4.8	5.6	1.6	3.6	7.4	2.5	4.0

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

OBSERVED MORTALITY RATE (•) AND PREDICTED RANGE (± 2 SD) FOR MEDICARE PATIENT ADMISSIONS FOR ALL CAUSES



MEDICAL CENTER OF DELAWARE
Medicare Provider Number: 080001

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	72.3 years
Proportion female	52.9 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	40.9 %
Transferred from skilled nursing facility	0.2 %
Admitted for elective procedure	24.6 %
Admitted for emergency	70.9 %

COMORBIDITIES:

Cancer	11.0 %
Chronic cardiovascular disease	34.1 %
Chronic liver disease	1.0 %
Chronic renal disease	3.7 %
Chronic pulmonary disease	11.3 %
Cerebrovascular degeneration	3.5 %
Diabetes mellitus	9.1 %

ORIGIN AND LENGTH OF STAY OF MEDICARE ADMISSIONS*

ORIGIN OF MEDICARE PATIENT ADMISSION:

County/City	82.7%
State	4.5%
Outside State	12.8%
Total	100.0%

MEDICARE AVERAGE LENGTH OF STAY:

Hospital	9.8 Days
State	9.0 Days
National	8.6 Days

HOSPITAL CHARACTERISTICS*

SOURCE: AHA Annual Survey of Hospitals** - Survey Year 1990

PROFILE:

Total Beds	924
Occupancy Rate	79.0 %
Ownership.Control	Private, Non-Profit
Medicare Discharges	27.3 %
Case Mix Index (CMI)	1.5353

STAFFING:

Total Number of Physicians	911
Percent of Physicians Board Certified Specialists	79.1 %
Medical Residents/Interns	164
Registered Nurses	1352
Licensed Practical Nurses	184

** Except for CMI

SPECIALTY SERVICES:

Burn Unit	No
Cardiac Intensive Care	Yes
Comprehensive Geriatric	No
Hospice Care	No
Medical/Surgical Intensive Care	Yes
Organ/Tissue Transplant	Yes
Other Intensive Care	No
Trauma Center	Yes

OTHER SPECIALTY/HOSPITAL-BASED SERVICES:

Alcohol/Drug	No
Rehabilitation	No
Psychiatric	Yes
Medicare Swing Beds	No

* Not used in calculating mortality rates

MILFORD MEMORIAL HOSPITAL INC

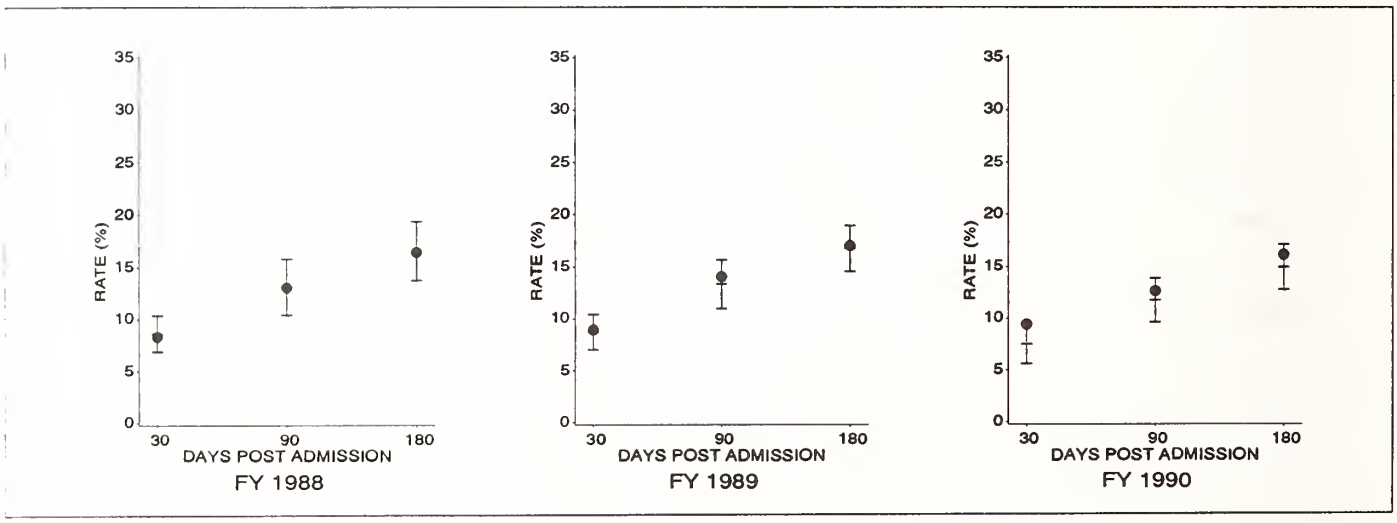
CLARKE AVENUE
MILFORD, DE 19963
Medicare Provider Number: 080002

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%)								
		30 DAYS			90 DAYS			180 DAYS		
		OBS	PRED	SD*	OBS	PRED	SD*	OBS	PRED	SD*
ALL CAUSES	1493	9.4	7.5	0.9	12.6	11.7	1.1	16.1	14.9	1.1
CONDITIONS:										
Acute Myocardial Infarction	41	39.0	28.9	-----	39.0	31.7	-----	41.5	34.7	-----
Congestive Heart Failure	80	21.2	13.9	6.8	28.7	21.9	6.4	35.0	27.9	7.3
Pneumonia/Influenza	53	15.1	11.2	5.4	15.1	16.0	6.8	20.8	19.6	7.4
Chronic Obstructive Pulmonary Disease	40	15.0	5.9	-----	20.0	10.7	-----	25.0	14.7	-----
Transient Cerebral Ischemia	32	3.1	1.2	-----	3.1	2.8	-----	3.1	4.7	-----
Stroke	52	19.2	16.5	6.9	23.1	22.8	5.9	25.0	26.4	6.2
Hip Fracture	38	13.2	6.7	-----	15.8	11.9	-----	15.8	15.5	-----
Sepsis	18	11.1	16.4	-----	22.2	22.4	-----	27.8	26.3	-----
PROCEDURES:										
Angioplasty	0									
Coronary Artery Bypass Graft	0									
Initial Pacemaker Insertion	11	0.0	1.7	-----	0.0	3.9	-----	0.0	6.2	-----
Carotid Endarterectomy	5	0.0	1.1	-----	0.0	2.1	-----	0.0	3.2	-----
Hip Replacement/Reconstruction	31	0.0	2.3	-----	3.2	4.2	-----	3.2	5.7	-----
Open Reduction of Hip Fracture	23	17.4	6.2	-----	17.4	11.4	-----	17.4	14.9	-----
Prostatectomy	78	0.0	0.9	1.3	1.3	2.2	1.8	1.3	3.7	2.8
Cholecystectomy	22	0.0	2.0	-----	0.0	3.3	-----	0.0	4.2	-----
Hysterectomy	4	0.0	0.5	-----	0.0	1.2	-----	0.0	2.0	-----

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

OBSERVED MORTALITY RATE (•) AND PREDICTED RANGE (± 2 SD) FOR MEDICARE PATIENT ADMISSIONS FOR ALL CAUSES



MILFORD MEMORIAL HOSPITAL INC
Medicare Provider Number: 080002

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	74.2 years
Proportion female	55.5 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	35.6 %
Transferred from skilled nursing facility	0.0 %
Admitted for elective procedure	19.7 %
Admitted for emergency	11.1 %

COMORBIDITIES:

Cancer	7.1 %
Chronic cardiovascular disease	29.8 %
Chronic liver disease	0.7 %
Chronic renal disease	1.6 %
Chronic pulmonary disease	16.4 %
Cerebrovascular degeneration	3.8 %
Diabetes mellitus	7.6 %

ORIGIN AND LENGTH OF STAY OF MEDICARE ADMISSIONS*

ORIGIN OF MEDICARE PATIENT ADMISSION:

County/City	62.8%
State	33.4%
Outside State	3.8%
Total	100.0%

MEDICARE AVERAGE LENGTH OF STAY:

Hospital	8.7 Days
State	9.0 Days
National	8.6 Days

HOSPITAL CHARACTERISTICS*

SOURCE: AHA Annual Survey of Hospitals** - Survey Year 1990

PROFILE:

Total Beds	141
Occupancy Rate	70.0 %
Ownership.Control	Private, Non-Profit
Medicare Discharges	38.9 %
Case Mix Index (CMI)	1.1690

STAFFING:

Total Number of Physicians	69
Percent of Physicians Board Certified Specialists	63.8 %
Medical Residents/Interns	0
Registered Nurses	141
Licensed Practical Nurses	29

SPECIALTY SERVICES:

Burn Unit	No
Cardiac Intensive Care	Yes
Comprehensive Geriatric	No
Hospice Care	No
Medical/Surgical Intensive Care	Yes
Organ/Tissue Transplant	No
Other Intensive Care	No
Trauma Center	No

OTHER SPECIALTY/HOSPITAL-BASED SERVICES:

Alcohol/Drug	No
Rehabilitation	No
Psychiatric	No
Medicare Swing Beds	No

** Except for CMI

* Not used in calculating mortality rates

NANTICOKE MEMORIAL HOSPITAL INC

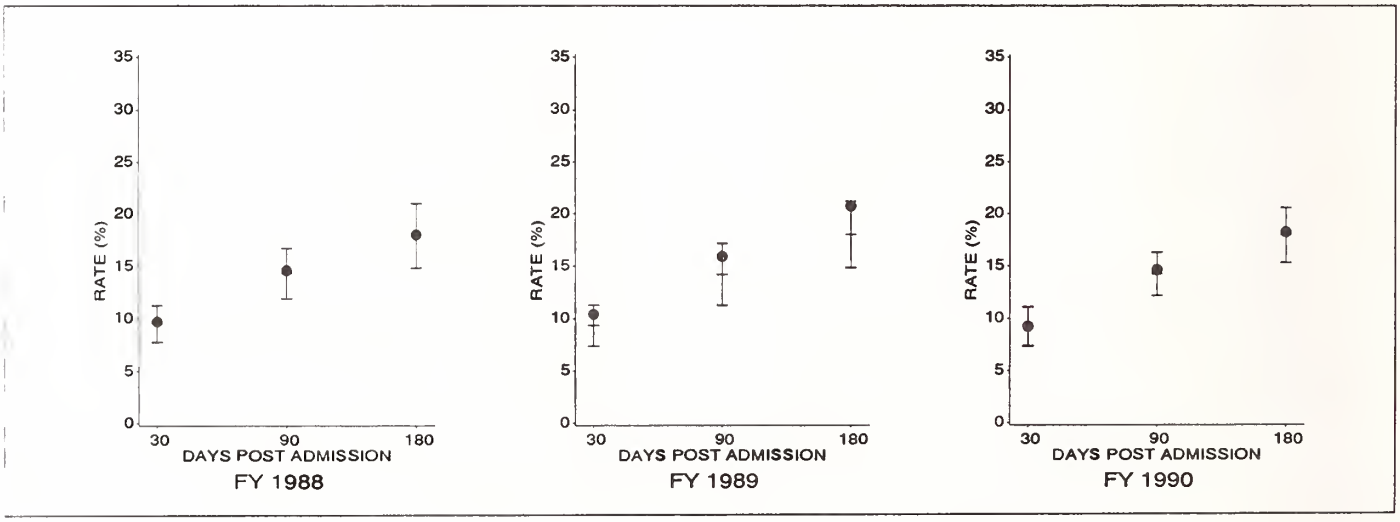
801 MIDDLEFORD RD
SEAFORD, DE 19973
Medicare Provider Number: 080006

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%) 30 DAYS OBS	30 DAYS PRED	30 DAYS SD*	90 DAYS OBS	90 DAYS PRED	90 DAYS SD*	180 DAYS OBS	180 DAYS PRED	180 DAYS SD*
ALL CAUSES	1236	9.2	9.2	0.9	14.6	14.2	1.0	18.2	17.9	1.3
CONDITIONS:										
Acute Myocardial Infarction	34	29.4	25.4	-----	29.4	29.0	-----	35.3	32.2	-----
Congestive Heart Failure	72	20.8	14.2	5.2	25.0	22.6	5.3	29.2	28.7	5.9
Pneumonia/Influenza	67	14.9	14.5	5.8	17.9	19.7	5.7	22.4	23.2	5.2
Chronic Obstructive Pulmonary Disease	23	4.3	7.7	-----	8.7	13.3	-----	13.0	17.7	-----
Transient Cerebral Ischemia	34	2.9	1.7	-----	2.9	4.0	-----	2.9	6.5	-----
Stroke	32	9.4	20.8	-----	25.0	27.9	-----	28.1	31.5	-----
Hip Fracture	24	8.3	6.4	-----	12.5	11.6	-----	12.5	15.1	-----
Sepsis	16	31.3	26.2	-----	37.5	32.9	-----	43.8	37.6	-----
PROCEDURES:										
Angioplasty	0									
Coronary Artery Bypass Graft	0									
Initial Pacemaker Insertion	4	0.0	3.8	-----	0.0	7.1	-----	0.0	9.6	-----
Carotid Endarterectomy	6	0.0	1.5	-----	0.0	2.7	-----	0.0	4.0	-----
Hip Replacement/Reconstruction	10	10.0	4.1	-----	10.0	7.6	-----	10.0	10.0	-----
Open Reduction of Hip Fracture	16	6.3	5.9	-----	12.5	11.1	-----	12.5	14.9	-----
Prostatectomy	31	3.2	0.9	-----	3.2	2.1	-----	3.2	3.5	-----
Cholecystectomy	25	4.0	3.4	-----	12.0	5.6	-----	12.0	6.9	-----
Hysterectomy	14	0.0	0.2	-----	0.0	0.4	-----	0.0	0.7	-----

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

OBSERVED MORTALITY RATE (•) AND PREDICTED RANGE (± 2 SD) FOR MEDICARE PATIENT ADMISSIONS FOR ALL CAUSES



NANTICOKE MEMORIAL HOSPITAL INC

Medicare Provider Number: 080006

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	74.6 years
Proportion female	59.8 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	41.3 %
Transferred from skilled nursing facility	0.2 %
Admitted for elective procedure	9.5 %
Admitted for emergency	64.2 %

COMORBIDITIES:

Cancer	9.0 %
Chronic cardiovascular disease	37.1 %
Chronic liver disease	1.7 %
Chronic renal disease	3.2 %
Chronic pulmonary disease	14.9 %
Cerebrovascular degeneration	4.2 %
Diabetes mellitus	6.3 %

ORIGIN AND LENGTH OF STAY OF MEDICARE ADMISSIONS*

ORIGIN OF MEDICARE PATIENT ADMISSION:

County/City	87.2%
State	3.6%
Outside State	9.2%
Total	100.0%

MEDICARE AVERAGE LENGTH OF STAY:

Hospital	9.2 Days
State	9.0 Days
National	8.6 Days

HOSPITAL CHARACTERISTICS*

SOURCE: AHA Annual Survey of Hospitals** - Survey Year 1990

PROFILE:

Total Beds	111
Occupancy Rate	79.0 %
Ownership.Control	Private, Non-Profit
Medicare Discharges	32.0 %
Case Mix Index (CMI)	1.1402

STAFFING:

Total Number of Physicians	59
Percent of Physicians Board Certified Specialists	55.9 %
Medical Residents/Interns	0
Registered Nurses	155
Licensed Practical Nurses	45

SPECIALTY SERVICES:

Burn Unit	No
Cardiac Intensive Care	No
Comprehensive Geriatric	No
Hospice Care	No
Medical/Surgical Intensive Care	Yes
Organ/Tissue Transplant	No
Other Intensive Care	No
Trauma Center	No

OTHER SPECIALTY/HOSPITAL-BASED SERVICES:

Alcohol/Drug	No
Rehabilitation	No
Psychiatric	No
Medicare Swing Beds	No

** Except for CMI

*** Not used in calculating mortality rates**

RIVERSIDE HOSPITAL

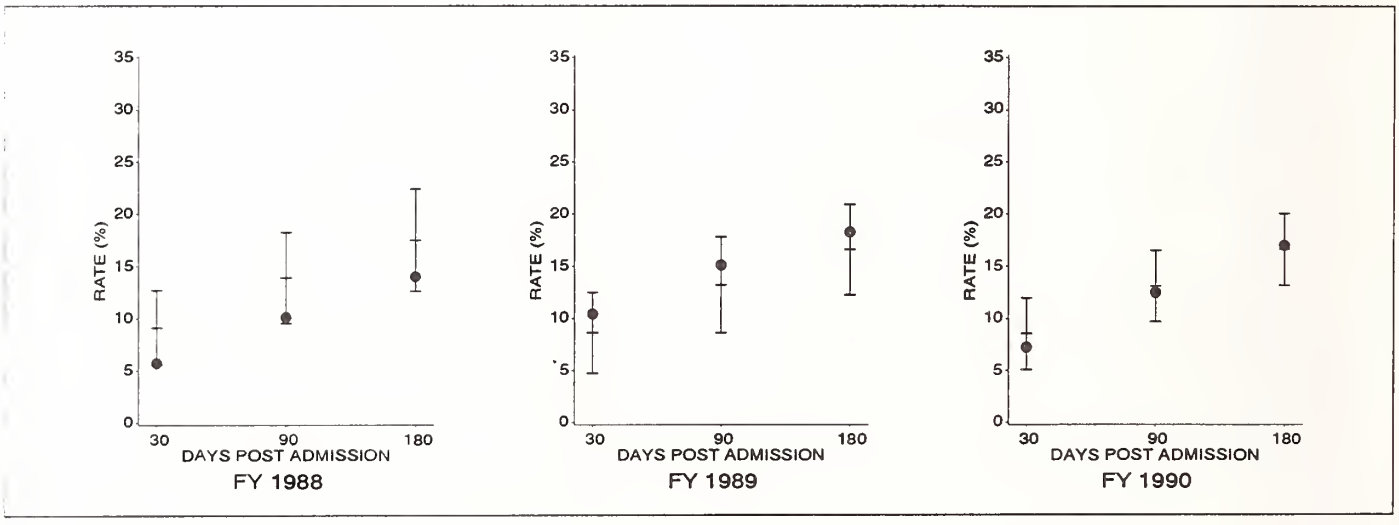
LEA BLVD & FRANKLIN PL
WILMINGTON, DE 19802
Medicare Provider Number: 080005

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%)								
		30 DAYS			90 DAYS			180 DAYS		
		OBS	PRED	SD*	OBS	PRED	SD*	OBS	PRED	SD*
ALL CAUSES	512	7.2	8.5	1.7	12.5	13.1	1.7	17.0	16.6	1.7
CONDITIONS:										
Acute Myocardial Infarction	16	0.0	25.6	-----	6.3	27.9	-----	6.3	30.2	-----
Congestive Heart Failure	37	21.6	15.3	-----	32.4	24.2	-----	32.4	30.0	-----
Pneumonia/Influenza	22	0.0	9.7	-----	0.0	13.1	-----	0.0	15.6	-----
Chronic Obstructive Pulmonary Disease	13	0.0	9.0	-----	7.7	16.1	-----	23.1	21.8	-----
Transient Cerebral Ischemia	7	0.0	1.2	-----	14.3	2.8	-----	14.3	4.8	-----
Stroke	16	18.8	17.9	-----	18.8	23.7	-----	25.0	27.3	-----
Hip Fracture	8	0.0	5.4	-----	12.5	9.7	-----	12.5	12.6	-----
Sepsis	9	22.2	26.9	-----	33.3	32.2	-----	44.4	35.7	-----
PROCEDURES:										
Angioplasty	0									
Coronary Artery Bypass Graft	0									
Initial Pacemaker Insertion	4	0.0	3.3	-----	25.0	6.9	-----	25.0	10.0	-----
Carotid Endarterectomy	2	0.0	1.3	-----	0.0	2.5	-----	0.0	4.0	-----
Hip Replacement/Reconstruction	3	0.0	4.0	-----	0.0	7.0	-----	0.0	8.9	-----
Open Reduction of Hip Fracture	5	0.0	5.0	-----	20.0	9.6	-----	20.0	12.7	-----
Prostatectomy	7	0.0	2.7	-----	0.0	5.3	-----	0.0	8.1	-----
Cholecystectomy	2	0.0	0.6	-----	0.0	1.2	-----	0.0	1.7	-----
Hysterectomy	3	0.0	0.2	-----	0.0	0.5	-----	0.0	0.8	-----

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

OBSERVED MORTALITY RATE (•) AND PREDICTED RANGE (± 2 SD) FOR MEDICARE PATIENT ADMISSIONS FOR ALL CAUSES



RIVERSIDE HOSPITAL
Medicare Provider Number: 080005

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	73.3 years
Proportion female	57.2 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	38.3 %
Transferred from skilled nursing facility	0.8 %
Admitted for elective procedure	17.0 %
Admitted for emergency	56.6 %

COMORBIDITIES:

Cancer	4.5 %
Chronic cardiovascular disease	23.8 %
Chronic liver disease	0.8 %
Chronic renal disease	5.7 %
Chronic pulmonary disease	14.6 %
Cerebrovascular degeneration	2.9 %
Diabetes mellitus	6.4 %

ORIGIN AND LENGTH OF STAY OF MEDICARE ADMISSIONS*

ORIGIN OF MEDICARE PATIENT ADMISSION:

County/City	94.6%
State	1.5%
Outside State	3.9%
Total	100.0%

MEDICARE AVERAGE LENGTH OF STAY:

Hospital	9.0 Days
State	9.0 Days
National	8.6 Days

HOSPITAL CHARACTERISTICS*

SOURCE: AHA Annual Survey of Hospitals** - Survey Year 1990

PROFILE:

Total Beds	69
Occupancy Rate	56.0 %
Ownership.Control	Private, Non-Profit
Medicare Discharges	38.9 %
Case Mix Index (CMI)	1.2643

STAFFING:

Total Number of Physicians	163
Percent of Physicians Board Certified Specialists	81.0 %
Medical Residents/Interns	11
Registered Nurses	72
Licensed Practical Nurses	17

SPECIALTY SERVICES:

Burn Unit	No
Cardiac Intensive Care	No
Comprehensive Geriatric	Yes
Hospice Care	No
Medical/Surgical Intensive Care	Yes
Organ/Tissue Transplant	No
Other Intensive Care	No
Trauma Center	No

OTHER SPECIALTY/HOSPITAL-BASED SERVICES:

Alcohol/Drug	No
Rehabilitation	No
Psychiatric	No
Medicare Swing Beds	No

** Except for CMI

* Not used in calculating mortality rates

ST FRANCIS HOSPITAL INC

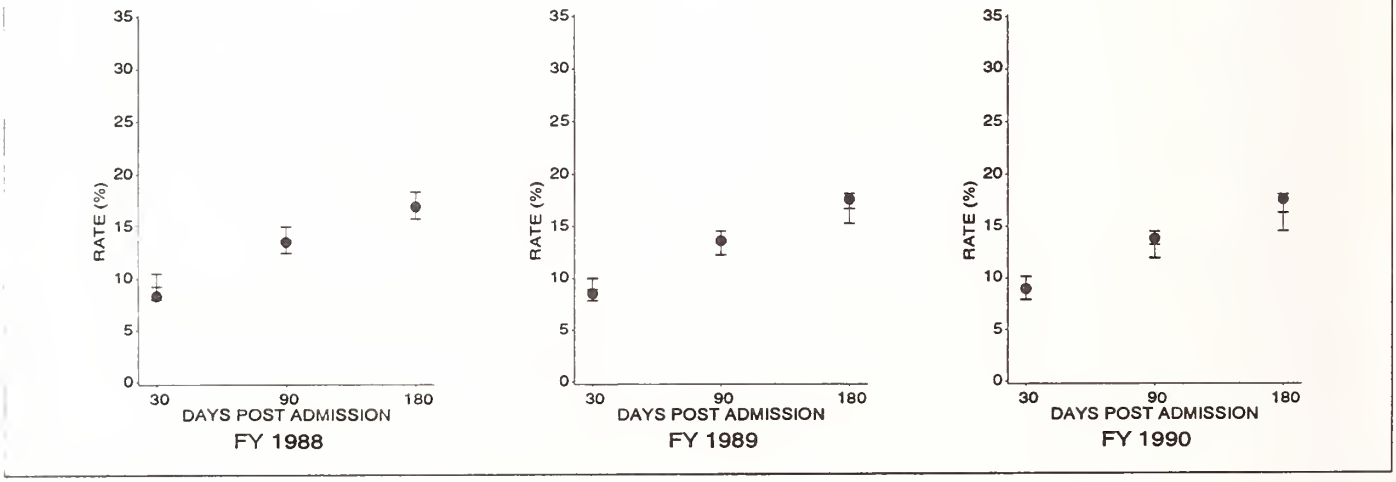
7TH CLAYTON STS
WILMINGTON, DE 19805
Medicare Provider Number: 080003

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%) 30 DAYS OBS	30 DAYS PRED	30 DAYS SD*	90 DAYS OBS	90 DAYS PRED	90 DAYS SD*	180 DAYS OBS	180 DAYS PRED	180 DAYS SD*
ALL CAUSES	3585	8.9	9.0	0.6	13.8	13.2	0.7	17.6	16.3	0.9
CONDITIONS:										
Acute Myocardial Infarction	126	29.4	28.7	4.1	34.9	32.0	4.8	39.7	35.2	5.6
Congestive Heart Failure	216	13.0	13.4	2.6	22.7	21.5	3.0	30.6	27.4	4.2
Pneumonia/Influenza	121	20.7	17.9	3.7	22.3	24.3	4.1	26.4	28.3	4.2
Chronic Obstructive Pulmonary Disease	43	7.0	8.3	-----	16.3	14.0	-----	20.9	18.4	-----
Transient Cerebral Ischemia	71	2.8	2.2	2.7	2.8	4.9	3.6	5.6	7.8	4.7
Stroke	162	19.8	20.7	3.4	27.2	26.9	3.5	31.5	30.7	3.7
Hip Fracture	88	14.8	6.9	4.3	21.6	12.0	5.7	25.0	15.3	6.2
Sepsis	50	34.0	30.3	-----	44.0	36.5	-----	50.0	40.7	-----
PROCEDURES:										
Angioplasty	0									
Coronary Artery Bypass Graft	1	0.0	2.5	-----	0.0	3.8	-----	0.0	4.2	-----
Initial Pacemaker Insertion	17	5.9	2.6	-----	5.9	5.2	-----	17.6	7.8	-----
Carotid Endarterectomy	12	0.0	1.2	-----	0.0	2.2	-----	0.0	3.1	-----
Hip Replacement/Reconstruction	94	4.3	2.4	2.7	8.5	4.3	4.1	9.6	5.6	5.0
Open Reduction of Hip Fracture	43	18.6	6.3	-----	20.9	11.3	-----	25.6	14.9	-----
Prostatectomy	165	0.0	0.8	0.9	0.6	1.9	1.2	0.6	3.2	1.8
Cholecystectomy	74	1.4	2.4	2.3	5.4	4.6	2.9	6.8	6.2	3.7
Hysterectomy	28	3.6	0.4	-----	3.6	0.9	-----	3.6	1.4	-----

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

OBSERVED MORTALITY RATE (•) AND PREDICTED RANGE (± 2 SD) FOR MEDICARE PATIENT ADMISSIONS FOR ALL CAUSES



ST FRANCIS HOSPITAL INC
Medicare Provider Number: 080003

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	75.1 years
Proportion female	59.0 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	39.4 %
Transferred from skilled nursing facility	0.9 %
Admitted for elective procedure	21.8 %
Admitted for emergency	53.0 %

COMORBIDITIES:

Cancer	5.3 %
Chronic cardiovascular disease	31.1 %
Chronic liver disease	0.8 %
Chronic renal disease	3.0 %
Chronic pulmonary disease	12.4 %
Cerebrovascular degeneration	3.7 %
Diabetes mellitus	8.4 %

ORIGIN AND LENGTH OF STAY OF MEDICARE ADMISSIONS*

ORIGIN OF MEDICARE PATIENT ADMISSION:

County/City	93.2%
State	1.3%
Outside State	5.5%
Total	100.0%

MEDICARE AVERAGE LENGTH OF STAY:

Hospital	9.1 Days
State	9.0 Days
National	8.6 Days

HOSPITAL CHARACTERISTICS*

SOURCE: AHA Annual Survey of Hospitals** - Survey Year 1990

PROFILE:

Total Beds	333
Occupancy Rate	76.0 %
Ownership/Control	Church
Medicare Discharges	42.7 %
Case Mix Index (CMI)	1.2163

STAFFING:

Total Number of Physicians	522
Percent of Physicians Board Certified Specialists	68.6 %
Medical Residents/Interns	15
Registered Nurses	388
Licensed Practical Nurses	45

SPECIALTY SERVICES:

Burn Unit	No
Cardiac Intensive Care	No
Comprehensive Geriatric	Yes
Hospice Care	No
Medical/Surgical Intensive Care	Yes
Organ/Tissue Transplant	No
Other Intensive Care	No
Trauma Center	No

OTHER SPECIALTY/HOSPITAL-BASED SERVICES:

Alcohol/Drug	No
Rehabilitation	Yes
Psychiatric	Yes
Medicare Swing Beds	No

** Except for CMI

* Not used in calculating mortality rates

DELAWARE

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%)								
		30 DAYS			90 DAYS			180 DAYS		
		OBS	PRED	SD*	OBS	PRED	SD*	OBS	PRED	SD*
ALL CAUSES	16,577	8.9	9.0	0.2	13.8	13.6	0.3	17.6	17.0	0.3
CONDITIONS:										
Acute Myocardial Infarction	623	25.5	25.2	1.8	28.6	28.5	1.8	32.9	31.4	2.4
Congestive Heart Failure	843	15.1	13.7	1.5	22.5	21.8	1.5	29.2	27.8	1.8
Pneumonia/Influenza	637	15.5	15.0	1.5	19.6	20.6	1.7	23.7	24.2	1.8
Chronic Obstructive Pulmonary Disease	229	9.2	7.9	2.2	15.7	13.6	3.7	20.1	18.0	4.3
Transient Cerebral Ischemia	244	2.0	1.7	1.2	3.3	3.9	1.4	5.3	6.3	1.8
Stroke	609	20.2	19.5	2.0	26.4	25.5	2.6	30.7	29.1	3.0
Hip Fracture	393	8.7	6.4	2.4	13.7	11.2	3.2	17.3	14.6	3.3
Sepsis	269	25.3	26.1	2.8	34.6	34.2	2.9	40.1	38.9	3.2
PROCEDURES:										
Angioplasty	119	0.0	2.9	2.0	0.8	4.0	2.4	1.7	5.0	2.8
Coronary Artery Bypass Graft	166	4.8	6.6	2.5	8.4	9.4	2.4	10.2	10.6	2.5
Initial Pacemaker Insertion	118	8.5	3.7	2.5	11.9	7.0	3.0	16.1	9.8	3.6
Carotid Endarterectomy	74	1.4	1.3	1.4	4.1	2.4	2.9	4.1	3.6	3.1
Hip Replacement/Reconstruction	313	4.2	3.0	1.5	6.7	5.7	2.0	8.9	7.7	2.4
Open Reduction of Hip Fracture	207	9.7	5.8	2.7	14.5	10.5	3.5	17.4	13.9	3.4
Prostatectomy	600	0.2	0.9	0.6	1.3	2.0	0.8	2.0	3.4	1.3
Cholecystectomy	291	2.1	2.5	1.0	5.5	4.7	1.3	7.2	6.4	2.0
Hysterectomy	125	3.2	0.5	2.8	3.2	1.2	2.1	4.0	1.9	1.9

* The Standard Deviation (SD) is not calculated if the number of deaths or cases is too small for satisfactory estimation.

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	73.6 years
Proportion female	55.3 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	37.8 %
Transferred from skilled nursing facility	0.4 %
Admitted for elective procedure	17.0 %
Admitted for emergency	54.3 %

COMORBIDITIES:

Cancer	7.8 %
Chronic cardiovascular disease	33.2 %
Chronic liver disease	0.9 %
Chronic renal disease	3.6 %
Chronic pulmonary disease	12.9 %
Cerebrovascular degeneration	3.5 %
Diabetes mellitus	8.3 %

ALL STATES

FY 1990 MEDICARE HOSPITAL MORTALITY RATES

CATEGORY	NUMBER OF CASES	MORTALITY RATES (%) 30 DAYS OBS	30 DAYS PRED	30 DAYS SD*	90 DAYS OBS	90 DAYS PRED	90 DAYS SD*	180 DAYS OBS	180 DAYS PRED	180 DAYS SD*
ALL CAUSES	6,542,299	9.0	9.0	-----	13.9	13.7	-----	17.3	17.1	-----
CONDITIONS:										
Acute Myocardial Infarction	204,673	25.3	25.6	-----	29.5	28.7	-----	32.1	31.4	-----
Congestive Heart Failure	335,426	14.3	14.4	-----	22.9	22.8	-----	29.2	29.0	-----
Pneumonia/Influenza	313,303	15.3	15.5	-----	21.5	21.3	-----	25.5	25.1	-----
Chronic Obstructive Pulmonary Disease	107,387	8.0	8.0	-----	14.1	14.0	-----	18.7	18.5	-----
Transient Cerebral Ischemia	96,866	1.8	1.8	-----	4.0	4.0	-----	6.4	6.5	-----
Stroke	241,803	19.7	19.8	-----	26.5	26.3	-----	30.4	30.0	-----
Hip Fracture	163,386	6.7	6.5	-----	11.7	11.5	-----	15.1	15.0	-----
Sepsis	80,999	25.6	25.7	-----	34.6	33.8	-----	39.8	38.6	-----
PROCEDURES:										
Angioplasty	58,026	3.0	3.0	-----	4.0	4.0	-----	5.0	4.9	-----
Coronary Artery Bypass Graft	80,798	6.0	5.7	-----	8.3	8.1	-----	9.5	9.2	-----
Initial Pacemaker Insertion	49,642	3.2	3.3	-----	6.5	6.3	-----	9.1	9.1	-----
Carotid Endarterectomy	29,990	1.6	1.5	-----	2.8	2.8	-----	4.0	4.1	-----
Hip Replacement/Reconstruction	122,156	3.4	3.2	-----	6.2	5.9	-----	8.1	8.0	-----
Open Reduction of Hip Fracture	80,075	6.1	6.0	-----	11.2	11.0	-----	14.5	14.5	-----
Prostatectomy	211,087	0.9	1.0	-----	2.2	2.3	-----	3.7	3.8	-----
Cholecystectomy	124,259	2.9	2.7	-----	5.0	4.9	-----	6.5	6.5	-----
Hysterectomy	53,905	0.7	0.7	-----	1.4	1.5	-----	2.2	2.4	-----

* The Standard Deviation (SD) is not calculated.

FY1990 VALUES FOR SELECTED EXPLANATORY FACTORS USED TO PREDICT MORTALITY RATES

DEMOGRAPHICS:

Average age at admission	74.1 years
Proportion female	55.9 %

ADMISSION SOURCES/TYPES:

Referred by personal or HMO physician	46.1 %
Transferred from skilled nursing facility	1.1 %
Admitted for elective procedure	22.0 %
Admitted for emergency	46.5 %

COMORBIDITIES:

Cancer	7.6 %
Chronic cardiovascular disease	36.6 %
Chronic liver disease	1.0 %
Chronic renal disease	3.4 %
Chronic pulmonary disease	15.0 %
Cerebrovascular degeneration	3.9 %
Diabetes mellitus	8.0 %

Hospital Comments

ST FRANCIS
HOSPITAL

Office of the President

March 19, 1992

Gail R. Wilensky, Ph.D., Administrator
Health Care Financing Administration
Medicare Hospital Information
Bureau of Data Management and Strategy
Rooms 3-A-12, Security Office Park Building
6325 Security Boulevard
Baltimore, Maryland 21207-5187
ATTN: Robert Moore

HCFA Mortality Data Release
Medicare Provider Number: 080003

Dear Dr. Wilensky:

St. Francis Hospital welcomes the opportunity to comment on the 1992 Medicare Hospital Information Report for Medicare patients discharges in Fiscal Year 1990. Although St. Francis Hospital is supportive of HCFA's efforts to improve the effectiveness of medical practice and the quality of care provided to Medicare beneficiaries, we do not believe that a comparison of hospital mortality rates will provide the public with meaningful conclusions regarding hospital performance.

Although the mortality data presented may be a useful screening tool to analyze the quality and effectiveness of the care provided to Medicare patients caution must be used in interpreting the data due to a number of shortcomings. First, it is of importance to note that the mortality rates are reflective of the Medicare population only, an elderly population with multiple medical problems. Secondly, mortality rates, in some categories, may appear skewed due to small sample sizes that are not statistically valid. Another area of possible misinterpretation is the methodology for determining mortality rates based on the patient's final diagnosis. The categorization of patients in this study is based on the patient's final diagnosis, that is, the reason, after study, for which the patient was admitted to the hospital. This categorization, may not however, represent the reason for the patient's death. For example, a patient included in the category of Pneumonia may actually have died from complications of a long standing condition (i.e. cancer) which may have affected the patient's health status. We do recognize HCFA's efforts to acknowledge this factor by its inclusion of a comorbidity table as a variable in the 1992 report. Lastly, mortality rates expressed at 90 and 180 day intervals as death may have been attributed to outside factors with no relevance to the reason for the patient's previous hospitalization.

7th & Clayton Streets P.O. Box 2500 Wilmington, Delaware 19805-0500

Regarding St. Francis Hospital's specific mortality information, it should be noted that the observed overall mortality rate for our hospital has remained within two standard deviations of the predicted range for Medicare patient admissions over the last three years. In four of the categories with higher than predicted mortality rates, the sample sizes were too small (less than fifty cases) to be statistically valid.

St. Francis Hospital performs a quality review of every case resulting in a mortality on a regular basis as an integral component of its quality assessment and improvement program. In addition, the Professional Review Organization also has had the opportunity to review these mortalities and has not identified any areas for concern.

St. Francis Hospital has always been known for its quality of care. The Medicare beneficiaries we serve affirm our dedication to them as they select us to be their hospital of choice in numbers clearly higher than a hospital of our size in our community would ever expect. We feel privileged to care for them in all stages of their life.

Again, we appreciate the opportunity to review and comment on the HCFA Mortality Data prior to its public release.

Respectfully yours,

Paul C. King, Jr.
President

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